Brief Report

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SARS CoV-2: a review of current treatment regimens

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Abstract

SARS CoV-2, otherwise known as Corona virus 2019 (COVID-19) has left >300,000 dead without a definitive cure in sight. Significant research has been conducted regarding the use of currently available pharmacotherapies and multiple clinical trials are underway to bring new treatments to market. While supportive treatment remains the standard of care, additional therapeutic regimens including antivirals, monoclonal antibodies, antibiotics, anti-inflammatories, immunoenhancers, vitamins, systemic steroids, inhalants, anticoagulants, and convalescent plasma are showing promise.

Keywords: SARS CoV-2, Corona virus, COVID-19, Treatment, Therapy

SARS CoV-2, otherwise known as Corona virus 2019 (COVID-19) has taken the world's heath system by storm and left >300,000 dead[1] without a definitive cure in sight. Significant research has been conducted regarding the use of currently available pharmacotherapies and multiple clinical trials are underway to bring new treatments to market. While supportive treatment remains the standard of care, additional therapeutic regimens are showing promise.

Categorically, current treatment options can be broken into the following: antiviral, monoclonal antibody, antibiotic, anti-inflammatory, immunoenhancer, vitamin, systemic steroid, inhalant, anticoagulant, and convalescent plasma[2,3].

Leading the way are antivirals with Remdesivir and Hydroxychloroquine/Chloroquine by reducing viral RNA production and inhibiting spike-protein binding to ACE2 receptors/limiting cytokine storm, respectively[2]. While Remdesivir appears to potentially shorten the disease process, Chloroquine treatment may be more mechanistically effective in the early stages of viral infection[2]. Other antivirals such as Favipiravir have also shown promise as well EIDD-2801, a new antiviral under investigation by researchers at Emory and Vanderbilt Universities as well as the University of North Carolina[3]. Lopinavir/ritonavir has not been shown to be effective against COVID-19[2,3].

Monoclonal antibodies such as Tocilizumab, Sarilumab, and Bevacizumab have shown promise in reduction of disease severity by limiting interleukin-6 production, thereby lessening the cytokine storm and associated acute respiratory distress syndrome seen in severe COVID-19 cases[3]. Antibiotics such as Azithromycin are being evaluated as adjunct therapies to the above mentioned antivirals due to anti-inflammatory effects; however, their additive side-effect profiles, such as cardiac toxicity in high doses, must be considered when using[2]. Nonsteroidal anti-inflammatory drugs such as Ibuprofen and Indomethacin have not been shown to be solely effective as treatments options and initial concerns regarding their upregulation of ACE2 receptors worsening the disease process have proven unfounded[2,3].

Immunoenhancers such as interferons, intravenous gamma globulins, and natural killer cell therapy have theoretical promise but have not been widely looked at within the COVID-19 realm and carry possible risks based on the strong inflammatory response elicited by their use[3]. Vitamin C, with its ability to support lymphocyte proliferation/neutrophil phagocytosis and vitamin D, with its ability to reduce viral replication rates through induction of antimicrobial peptides, are currently being evaluated regarding their efficacy in COVID-19 treatment[3].

Systemic steroids and inhalant treatments such as nitric oxide are not recommended for individual treatment of COVID-19 but may be effective as supportive therapy in those with severe viral-associated acute respiratory distress syndrome[2]. Anticoagulation, due to the risk of micro and macro venous thromboembolism, has been well-vetted within the current pandemic setting and further evaluation of heparin for use as a therapeutic agent is underway due to findings suggesting its abilities to inhibit viral attachment via Spike receptor conformational changes[2,3]. Finally, treatment via infusion of convalescent plasma containing COVID-19 antibodies derived from pandemic survivors has shown promise and received FDA approval for the treatment of critically ill patients[2,3].

References

[1] Roser M, Ritchie H, Ortiz-Ospina E, *et al*. Coronavirus (COVID-19) deaths. 2020. Available at: https://ourworldindata.org/covid-deaths. Accessed May 16, 2020.

[2] Wu R, Wang L, Kuo HCD, *et al*. An update on current therapeutic drugs treating COVID-19. Curr Pharmacol Rep 2020:1–5.

[3] Zhang J, Xie B, Hashimoto K. Current status of potential therapeutic candidates for the COVID-19 crisis. Brain Behav Immun 2020;87:59–73.

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