

LETTER TO THE EDITOR

Open Access



Bi-anti therapy for SARS-CoV-2 infection among mild/moderate patients to prevent coronavirus disease 2019 from progressing to severe disease

Jian Xu*

Dear editor,
Coronavirus disease 2019 (COVID-19) caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is spreading around the world. The number of hospitalizations of the COVID-19 is increasing dramatically, which poses a challenge to global healthcare resources. Under the condition of limited medical resources, what can we do to reduce the hospitalization rate of patients?

After being transported to the cell surface, spike protein on the surface of SARS-CoV-2 allows the infected and healthy cells to be fused, resulting in the host cells, tissues, and organs injury [1]. Earlier studies found that the severe COVID-19 tend to have a high viral load [2]. SARS-CoV-2 infection is an initial factor to cause host damage. Therefore, it is speculated that the damage of early patients is mainly related to the direct attack of the virus on the host, antiviral therapy early might be a useful strategy for preventing disease from progressing into severe or critical cases. Drugs of direct antiviral, including nirmatrelvi/ritonavir and molnupiravir, opened a new window in the treatment of COVID-19 [3]. If these drugs of direct antiviral can be used in the outpatient

department timely, the viral load of patients can be reduced as soon as possible to reduce the transmissibility, and more patients can be prevented from developing into severe or critical illness.

In addition to the direct damage caused by the virus, SARS-CoV-2-induced host inflammatory response is a key factor in disease progression. The inflammatory response caused by SARS-CoV-2 is generally divided into three stages: local general inflammation stage, acute systemic inflammation stage, and chronic systemic inflammation stage of low intensity [4]. At the local general inflammation stage, SARS-CoV-2 infection is mainly manifested as a local inflammatory response, mainly manifested as fatigue, fever, dry cough, sore throat, and so on [5]. These symptoms reflect an underlying excessive inflammatory response to the viral infection. If the local inflammation is controlled at this stage, the disease will rarely develop into acute systemic inflammation stage where severe cases can be happened. Therefore, in addition to antiviral, anti-inflammation at the mild/moderate SARS-CoV-2 infection in the outpatient would prevent progression to severe illness. Non-steroidal anti-inflammatory drugs (NSAIDs) and glucocorticoids seem to be a valuable therapeutic strategy for anti-inflammatory to reduce severe COVID-19-related illness in the outpatient stage of COVID-19. Therefore, as shown in Fig. 1, we recommend “bi-anti” (antiviral and anti-inflammatory simultaneously) therapy in an outpatient setting at the early stages of SARS-CoV-2 infection.

*Correspondence:

Jian Xu

1106134514@qq.com

Department of Infectious Disease, The People's Hospital of Yubei District of Chongqing City, No.23, North Central Park Road, Yubei District, Chongqing 401120, China



© The Author(s) 2023. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

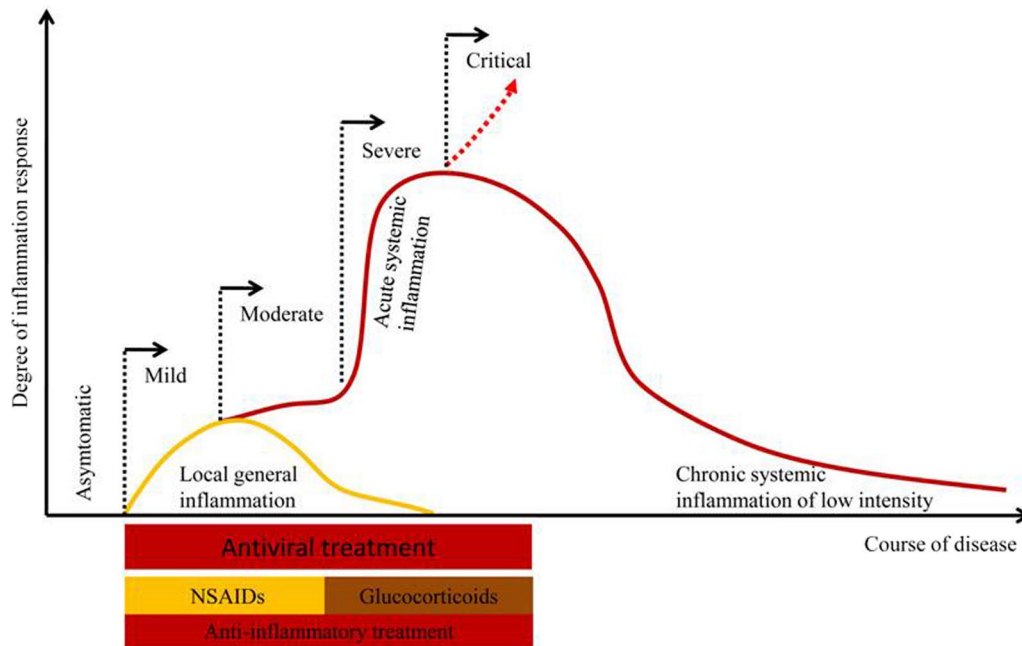


Fig. 1 SARS-CoV-2 infection induced inflammatory response and “bi-anti” therapy

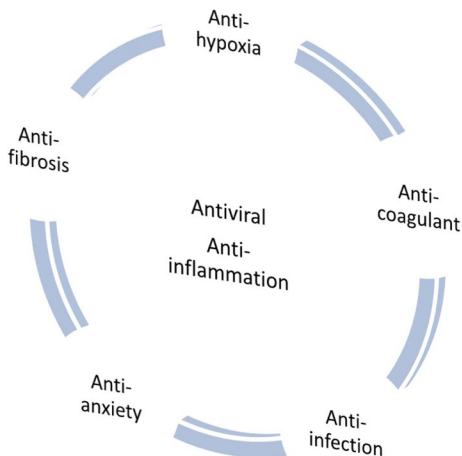


Fig. 2 Comprehensive treatment strategies for SARS-CoV-2 infection

Overall, SARS-CoV-2 infection is only the initiating factor of the COVID-19, and the host’s immune response induced by SARS-CoV-2 is the key factor resulting in the disease progression. Therefore, we propose the concept of “bi-anti” at the mild/moderate stage of SARS-CoV-2 infection to prevent the COVID-19 from developing into severe or critical disease. However, the pathogenesis of SARS-CoV-2 infection is complex. Early “bi-anti” therapy would provide an opportunity to intervene before infected individuals develop into severe illness. It is worth mentioned that we mainly want to appeal to this early

“bi-anti” therapy concept for mild and moderate patients, the treatment of COVID-19 should not only be limited to antiviral and anti-inflammatory, but also a comprehensive approach including anti-hypoxia, anti-coagulant, anti-infection, anti-anxiety, and anti-fibrosis therapy for severe patients (Fig. 2).

Acknowledgements

The authors express their thanks to the “American Journal Experts” for their language modification to this manuscript.

Author contributions

The author read and approved the final manuscript.

Funding

Not applicable.

Availability of data and materials

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The author has no financial or personal relationships with the people or organizations discussed in the manuscript.

Received: 31 January 2023 Accepted: 2 February 2023

Published online: 06 February 2023

References

1. Shang J, Wan Y, Luo C, et al. Cell entry mechanisms of SARS-CoV-2. *Proc Natl Acad Sci U S A*. 2020;117(21):11727–34.
2. Liu Y, Yan LM, Wan L, et al. Viral dynamics in mild and severe cases of COVID-19. *Lancet Infect Dis*. 2020;20(6):656–7. [https://doi.org/10.1016/S1473-3099\(20\)30232-2](https://doi.org/10.1016/S1473-3099(20)30232-2).
3. Couzin-Frankel J. Antiviral pills could change pandemic's course. *Science*. 2021;374(6569):799–800. <https://doi.org/10.1126/science.acx9605>.
4. Gusev E, Sarapultsev A, Hu D, Chereshnev V. Problems of pathogenesis and pathogenetic therapy of COVID-19 from the perspective of the general theory of pathological systems (general pathological processes). *Int J Mol Sci*. 2021;22(14):7582.
5. Shoaib MH, Ahmed FR, Sikandar M, Yousuf RI, Saleem MT. A journey from SARS-CoV-2 to COVID-19 and beyond: a comprehensive insight of epidemiology, diagnosis, pathogenesis, and overview of the progress into its therapeutic management. *Front Pharmacol*. 2021;12:576448.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

