Another new application of heparin in COVID-19: more than anticoagulation and antiviral

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Abstract

Heparin is used as a classic anticoagulant in clinic. In addition, with the ongoing pandemic and unknown challenges, the mechanism of action of heparin in antiviral and anti-inflammatory aspects has been constantly discovered and clarified. This also provides effective support for the treatment of COVID-19 in specific contexts. Most importantly, heparin may act as a multi-drug.

Another new application of heparin in COVID-19: more than anticoagulation and antiviral

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Abstract: Heparin is used as a classic anticoagulant in clinic. In addition, with the ongoing pandemic and unknown challenges, the mechanism of action of heparin in antiviral and anti-inflammatory aspects has been constantly discovered and clarified. This also provides effective support for the treatment of COVID-19 in specific contexts. Most importantly, heparin may act as a multi-drug.

Keywords: COVID-19; heparin; anticoagulant, anti-inflammatory, antiviral

Dear editor, we read with great interest an article in your journal about heparin inhibits the infection of novel coronavirus [1]. Therefore, we were surprised to learn that heparin is a classic anticoagulant that has antiviral effects. Especially in the context of the pandemic, it provides hope for clinician decision making for the treatment of COVID-19 patients. In particular, there is still no accurate and effective anti-novel coronavirus intervention drugs in clinical practice. However, we would like to emphasize that heparin may have a key anti-inflammatory effect on severe COVID-19.

Heparin has been widely used clinically for its classical anticoagulant effects, including sepsis induced coagulopathy. It is reported that heparin has been shown to have a significant effect on blocking the inflammatory storm of sepsis in an unprecedented way. In general, heparin inhibits HMGB1 - lipopolysaccharide (LPS) interactions and prevents macrophage heparinase from degrading glycocalyx [2]. To the best of our knowledge, HMGB1 is an important part of the damage-associated molecular patterns (DAMPs) family. In addition, the study suggests that even if the anticoagulant part of heparin was removed, it could also play a significant anti-inflammatory effect in sepsis through the HMGB1 pathway. In other words, modified heparin can be used in other inflammatory diseases without concern for its classical pharmacological side effects.

As COVID-19 continues and it presents new challenges, efficient antiviral and anti-inflammatory drugs are urgently needed clinically. Most important of all, antiviral, anti-inflammatory, and anti-coagulant therapies

are three important aspects of COVID-19 therapy. Intriguingly, heparin has exactly three potential therapeutic effects, and it is therefore possible to kill many birds with one arrow. There may be a basis for using heparin aggressively in these patients in the future. Despite the fact that it is an old drug, we still have reason to be optimistic.

Declarations

*Ethics approval and consent to participate

Not applicable

*Consent for publication

Not applicable

*Availability of data and materials

Not applicable

*Competing interests

The authors declare that they have no competing interests

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*Authors' contributions

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