

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

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Dear Editor,

We read with great interest an article in your journal about the relationship between heparin dose and anticoagulation effect of COVID-19 infection.¹ As the pandemic continues to spread and challenge, it is particularly important to standardize treatment protocols for COVID-19 anticoagulation. To the best of our knowledge, heparin-binding protein (HBP) has important clinical value as an early predictor of COVID-19 and its combination with heparin plays a key role in anticoagulant therapy.² In particular, the latest reports have unprecedentedly confirmed the anti-inflammatory mechanism of heparin in sepsis. From this perspective, heparin may play a double-edged sword effect in the anti-inflammatory and anticoagulant effects of severe COVID-19.

It is reported that heparin inhibited HMGB1–lipopolysaccharide interactions and prevented macrophage heparinase from degrading glyco-calyx.³ HMGB1 is a well-studied component of the damage-associated molecular pattern family. As a key potential therapeutic target in the occurrence and development of sepsis, it has always been the target of drug exploration. It is well known that heparin is a pluripotent drug for clinical favor, including anticoagulant, lipid-lowering, anti-inflammatory, and so on. But to be clear, little is known about the mechanism by which heparin exerts its anti-inflammatory effects. We also noted 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 inflammatory diseases without concern for its classical pharmacological side effects. Severe COVID-19 is often faced with a combination of severe inflammation and coagulation disorders. In particular, elevated HBP levels in patients with severe COVID-19 provide the possibility of carrying exogenous heparin. Therefore, from this point of view, heparin has multiple clinical values of anticoagulation and anti-inflammatory in the treatment of severe COVID-19. We have noted that there are currently a series of

randomized controlled trials of heparin in the treatment of COVID-19 anticoagulants. Therefore, the next focus should be to consider which patients with COVID-19 will benefit from heparin treatment, which will not, and which may even be impaired. With this in mind, the appropriate range of heparin in the treatment of patients with COVID-19 and the balance of its anticoagulant and anti-inflammatory doses are urgently needed to be clarified.

As the pandemic continues to spread and brings uncertain risks, targeted intervention drugs for severe COVID-19 are of far-reaching significance. In particular, heparin, as a potentially effective anti-inflammatory agent in severe patients, combined with its own anticoagulant effect may play a significant role in the treatment of severe COVID-19. The clarity of the anti-inflammatory mechanism of heparin through HMGB1 pathway gives us sufficient confidence in its potential anti-inflammatory value in patients with severe COVID-19. After all, there is reason to be optimistic about heparin as a new trial for an old drug.

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