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Challenges of Convalescent Plasma Therapy on COVID-19

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To the Editor,

There are only a few available antiviral treatments, which have limited efficacy on COVID-19 at present. The latest Chinese guideline emphasized that convalescent plasma(CP) therapy was an emergent treatment for serious COVID-19 cases[1]. Generally, CP has been applied to improve the survival rate of patients with a variety of viral epidemics, including SARS, MERS, influenza, Ebola virus disease, etc[2]. More recently, COVID-19 cases have also shown improvement to a certain degree after CP therapy in China[3]. In order to take full advantage of this promising treatment, there are still several critical problems need to be clarified.

Studies have shown that viremia, such as SARS, usually peaks in the first week of infection[4]. In the second week after symptom onset, patients usually develop an immune response which is more likely to cause cytokine storm that could be lethal[4,5].

Although there is one study which has indicated that CP therapy could reduce serum cytokine response with uncertain implementing time[6], CP infusion still has its latent risk such as aggravating hyperimmune attacks, based on the foundation that CP therapy is passive immunity with administering pathogen-specific antibodies to patients[2]. This implies that CP therapy is more effective in earlier stage of disease and researches on SARS have confirmed it[4,7]. Therefore, the optimal timing of administering CP on COVID-19 needs to be carefully considered.

In fact, the therapeutic effect of CP on COVID-19 is determined by the level of SARS-CoV-2 neutralizing antibody titer (NAT). A research on SARS demonstrated that the specific IgG began to increase around week 3 after onset, and peaked at week 12[8]. Besides, another study on influenza suggested that CP with a NAT level of ≥1:160 reduced mortality[6]. Thus, CP from donors who have recovered and who are at week 12 after onset with a NAT level of not less than 1:160 is expected to be more effective. Moreover, due to various limitations of acquiring CP such as age, weight, state of health, informed consent, the amount of CP required, the ratio of recovered patients to those who

need plasma causes the shortage of CP. As a result, the source of CP limits its wide application, especially in countries which are in the acceleration stage and late accumulation stage of COVID-19 development.

In addition, the most common adverse reaction of CP therapy are transfusion-related events, involving chills, fever, anaphylactic reactions, transfusion-related acute lung injury, circulatory overload and hemolysis, etc[9,10]. Meanwhile, the risk of transfusion-transmitted infections, such as human immunodeficiency virus, hepatitis B virus, hepatitis C virus and syphilis, should not be neglected[11]. Hence, how to use CP therapy properly becomes an issue which we need pay attention to.

In conclusion, CP therapy as a potential treatment for COVID-19, there are still some challenges to be dealt with. But considering the absence of specific treatment, we recommend that CP therapy could be an alternative option in emergent situation of COVID-19.

Declarations of interest: none

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