LETTER

Convalescent plasma for patients with COVID-19

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The ongoing worldwide pandemic of coronavirus disease 2019 (COVID-19) (1), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has posed a huge threat to global public health, while no specific treatment is recommended for therapy (2). In Duan et al.'s study (3), they observed a large clinical improvement in 10 severe COVID-19 patients treated with convalescent plasma transfusion. Despite some limitations, this traditional therapy sheds light on the therapy for severe and critical COVID-19 patients (3, 4). However, some doubts were generated during the process of reading their study that we would like to highlight and discuss with the authors.

First, we wonder whether inactivating the virus using methylene blue and light (MBL) is necessary for convalescent plasma before transfusion. In Duan et al.'s study (3), MBL was used to inactivate the virus, which could reduce several coagulation factors, especially fibrinogen and factor VIII in convalescent plasma (5). However, a study by Shen et al. (6) reported that convalescent plasma was transfused immediately without inactivating the virus, which had a positive effect on severe and critically ill COVID-19 patients. Second, what is the optimal time to collect the convalescent plasma from the donor? According to the "Clinical Treatment of Convalescent Plasma for COVID-19 (trial edition 2)" published by the National Health Commission of China (7), the donor's blood should be collected 3 wk following the onset of illness. Duan et al. (3) collected the donor's blood 3 wk after onset of illness and 4 d after discharge. However, in Shen et al.'s study (6), blood was collected 10 days after discharge, and the duration from the onset of illness to blood collection was unclarified. The optimal time to collect the convalescent plasma needs to be clarified. Third, the total antibody dose (the transfused volume of convalescent plasma multiplied by SARS-CoV-2 neutralizing antibody titer) for adults needs further investigation. Enzyme-linked immunosorbent assay was used to test the SARS-CoV-2 neutralizing antibody titer in both studies. In the study by Duan et al. (3), 200 mL convalescent plasma with a neutralization titer above 640 was transfused, while 400 mL convalescent plasma with a neutralization titer above 1,000 was transfused in Shen et al.'s study (6). Patients in both studies had positive clinical improvements. The optimal dose still needs to be clarified to help reduce the dosage of convalescent plasma and treat more patients. Finally, neither study described the previous severity of the COVID-19 donors. Whether convalescent plasma of COVID-19 donors with different degrees of severity has different therapeutic effects remains to be further investigated.

In conclusion, answering the above questions will help in defining the standards required for using convalescent plasma in severe or critical COVID-19 patients.

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