LETTER

Get rid of the bad first: Therapeutic plasma exchange with convalescent plasma for severe COVID-19

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We read the article by Duan et al. (1) with great interest and are deeply impressed by the promising results for severe coronavirus disease 2019 (COVID-19) patients worldwide. The authors transfused convalescent plasma (CP) into 10 patients on average 15.7 d after symptom onset. However, only 3 of 10 patients' respiratory status, together with laboratory parameters, improved after CP transfusion (1). In a similar study from China, CP was transfused into five patients on average 21 d after symptom onset and on average the seventh day of mechanical ventilator therapy (2). In that study it was reported that while body temperature normalized within 3 d, Sequential Organ Failure Assessment score, PaO_2/FiO_2, and inflammatory parameters (C-reactive protein [CRP], procalcitonin, and interleukin 6 [IL-6]) improved within 12 d (2). It was also emphasized in a recently published case series that elevated inflammatory indicators (IL-6 and CRP) are associated with fatal outcome and mortality (3). While we appreciate the efforts of the authors and results of these studies, we think that immunomodulatory therapy should be performed earlier and more effectively in patients with severe COVID-19.

In the large case series of COVID-19, thrombocytopenia was present in 20 to 57.7% of the severe patients with multiorgan failure (4). Also, elevated lactate dehydrogenase was present in the majority (58.2%) of the severe patients. This situation is consistent with thrombocytopenia-associated multiple organ failure (TAMOF) in which early recognition and rapid therapeutic plasma exchange (TPE) results in significantly improved outcomes (5). TPE acts by removing pro- and anti-inflammatory mediators, replenishing coagulation proteins, and restoring ADAMTS-13 activity (5). Considering the severe COVİD-19 cases as TAMOF prompt TPE should be the preferred treatment option. In the light of the results from Duan et al. (1) and Shen et al. (2) we recommend early TPE by CP as replacement fluid; 1.5 volume of patients' plasma should be removed for effective cytokine clearance (6). Performing TPE with CP will provide removal of chaotic proinflammatory cytokines as well as the positive effects of CP transfusion. It is obvious that more CP will be needed for this procedure than the conventional CP transfusion but we think that this will not be a problem because there are 319,064 recovered people worldwide as of 8 April 2020 (7). Nonetheless, more CP may accelerate the healing process.

Timing of immunomodulatory treatments in cases of clinical situations characterized with hypercytokinemia is crucial, and early initiation of treatment is associated with better outcome (8). In severe COVID-19 patients it was reported that the inflammatory factors associated with diseases mainly containing IL-6 were significantly increased around 7 to 14 d after onset, which also contributed to the aggravation of the disease (9). CP was transfused on average 15.7 and 21 d after symptom onset in those studies (1, 2). Considering the pathophysiological course of the disease, this timing is relatively late for immunomodulatory therapy.

Until vaccines for COVID-19 are available, it is obvious that novel treatment options for increasing severe cases are urgently needed to reduce mortality. We suggest that TPE applied with CP should be considered as a therapeutic option in severe COVID-19 patients within the first week of symptom onset.

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