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Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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## Letter to the Editor

## Immunomodulation for the management of corona virus disease (COVID-19)



The corona virus disease (COVID-19) has caused a global health and economic crisis.

Currently there is no vaccine for prophylaxis nor proven treatment for COVID-19.

Immune or convalescent plasma collected from people who have fully recovered from infection contains antibodies against the infectious agent. Convalescent plasma provides passive immunity and has been used for the prophylaxis and treatment of a number of infectious diseases, including recent epidemics with SARS-Cov-1, Ebola and Middle Eastern Respiratory Syndrome (MERS) [1]. Small studies from China have demonstrated that infusion of convalescent plasma from people who have recovered from COVID-19 is safe and results in reduction of viral load and improved clinical outcome. This prompted the FDA to allow the use of convalescent plasma in patients with COVID-19 [1]. The proposed infusion dose is 200 mL of plasma. However, this is based on the Chinese experience alone and deserves further study.

Older adults and people with severe underlying conditions are at higher risk for developing more serious complications from COVID-19 and account for the majority of the deaths. Systemic chronic inflammation is believed to be the major cause of immunosenescence. A prominent feature of the aging phenotype is increased secretion of proinflammatory cytokines which may contribute to the cytokine storm seen in COVID-19. Older adults experience down regulation of the immune response that leads to an increased susceptibility to viral infections and weakened response to vaccines. Collateral damage from chronic inflammation is oxidative stress [2].

Experimental studies in rodents using parabiosis and blood exchange models have demonstrated that the removal of proinflammatory substances from the circulation of old mice leads to a rapid and robust rejuvenation of multiple organs [3]. Since parabiosis is not possible in humans, therapeutic plasma exchange, (TPE) has been proposed as an alternative because it has a multifaceted immunomodulatory effect [4].

TPE has been shown in randomized and non-randomized clinical trials to have a beneficial effect in sepsis associated with severe inflammatory response syndrome (SIRS) [5]. And recently, TPE has been successfully used in the treatment of severe cytokine release syndrome after Chimeric Antigen Receptor T cell (CAR-T) infusion. TPE with 5% albumin replacement also provides a significant antioxidant boost [5].

We believe that TPE with a combination of 5% albumin and convalescent plasma replacement at the end of the procedure can be a valuable treatment option for COVID-19 patients and warrants a comparison trial with simple convalescent plasma infusion.

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