

## Letter to the Editor:

## Convalescent Plasma: An Old Trick for the Treatment of COVID-19



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## Dear Editors:

**N**ine hundred years earlier than the first experimental application of blood serum by Von Behring and Kitasato for the treatment of diphtheria in 1890, Avicenna (980-1037), Iranian famous physician and philosopher, used serum therapy for the first time for the treatment of rabies (1). Convalescent plasma therapy (CPT) has been long used for the prophylaxis or treatment of bacterial and viral infectious diseases since 1920. CPT was also used in different epidemic or pandemic diseases such as Spanish influenza, measles, chickenpox, H1N1, H5N1 avian flu, severe acute respiratory syndrome coronavirus (SARS-CoV), ebolavirus, and the Middle East respiratory syndrome coronavirus (MERS-CoV) (2).

After identification of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in December 2019 in Wuhan, China, and its related coronavirus disease 2019 (COVID-19), the World Health Organization (WHO) declared a Public Health Emergency of International Concern on January 30, and a pandemic on March 11, 2020.

According to WHO, COVID-19 has no specific treatment or vaccine but clinical trials are going to evaluate the efficacy and safety of candidate medications (3).

As stated in the investigations of CPT in influenza, MERS, and Ebola in recent years, clinical studies about COVID-19 were designed around the world. To this day, 61 clinical trials on CPT have been submitted in the ClinicalTrials.gov for COVID-19.

In an uncontrolled case series study that was conducted in China, convalescent plasma (CP) containing neutralizing antibodies was administrated (2 consecutive transfusions of 200-250 mL of CP) to 5 critically ill patients with COVID-19 and acute respiratory distress syndrome (ARDS). All patients had received standard treatment as well. The results showed that general clinical signs improved in 4 patients and viral loads also decreased and became negative within 12 days after the transfusion. Furthermore, SARS-CoV-2-specific and neutralizing antibodies titers increased following the transfusion and ARDS resolved in 4 patients after 7 and 12 days of transfusion, respectively (4).

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In another pilot study that was designed in China, the effectiveness of a single dose (200 mL) of CP in COVID-19 patients was explored. The results indicated that CP could dramatically boost the humoral immune system and promote the SARS-CoV-2 blood clearance in 7 days. Simultaneously, clinical and laboratory criteria immediately recovered within 3 days after CPT (5).

To date, most published studies on CPT in COVID-19 are pilot studies or case reports and were not investigated in randomized clinical trials (RCTs). It should be considered that RCTs must be designed to validate the results and outcomes in a treatment group must be compared with outcomes in a control group.

The RCTs in CPT are conducting in the United States as National COVID-19 Convalescent Plasma Project (<https://ccpp19.org/index.html>) from 57 institutions in 46 states who have self-organized for investigating the use of convalescent plasma in the current COVID-19 pandemic. The national program of RCTs in CPT is also designed in England.

CPT may also be proposed for prophylactic application in threat-exposed individuals, such as those with diminished health status or healthcare workers exposed to COVID-19 patients. As a result of CPT in SARS-CoV-1 patients, CP must be collected from recovered donors that have some eligibility such as lack of symptoms at least 14 days before donation, negative RT-PCR test, positive specific antibody test (optimally the antibody titers greater than 1:320), and negative anti-HLA test (6).

Overall, CPT may improve the outcomes of critically-ill COVID-19 patients without significant toxicities. Still, RCTs are needed to confirm the results of pilot studies.

## Ethical Considerations

### Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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### Authors' contributions

All authors were equally contribute in preparing this article.

## Conflicts of interest

The authors declared no conflict of interest.

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