

PLASMA THERAPY

A POTENT TOOL AGAINST CORONAVIRUS

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Introduction:

Plasma represents a “cosmic soup” of fixed/freely moving ions, enzymes, active species, antibodies and energetic UV photons. Plasma therapy involves administration of immunoglobins containing plasma of recently recovered person of a particular disease to the individual who is susceptible/ infected with the same disease. This is helpful in terms of diseases where vaccine production is a big task i.e. Covid-19. In this case, Convalescent Plasma (CP) Therapy is acting as a boon. Convalescent/ Immune plasma refers to plasma that is assembled from individuals, following resolution of infection and development of antibodies.

Passive antibody therapy has been in trend for over a century. The therapy deals with the administration of the reactive agents (antibodies) against the target pathogen of interest. Nowadays, passive antibody therapy relies primarily on pooled immunoglobulin preparations that contain high concentrations of antibodies. In contrast, plasma has been used emergently in epidemics where there is insufficient time or resources to generate immunoglobulin preparations. Passive antibody therapy, through transfusion of convalescent plasma, may prevent clinical infection or blunt clinical severity in individuals with recent pathogen exposure.

WHAT IS PLASMA THERAPY

THE THERAPY

- Entails giving patients a transfusion with plasma (or serum) from those who have developed antibodies to a virus or bacteria
- This process grants the patient some passive immunity. Convalescent blood is an option if there are no medicines or vaccines to treat an infectious disease
- The first valid trial was done in 1892 for diphtheria, using serum from animals

SIDE-EFFECTS

- No definitive studies exist showing effectiveness. In case of dengue, convalescent serum was found to make patients worse, as it led the virus to replicate
- There could be transfusion-associated reactions. Unknown pathogens could be transferred into a patient during transfusion

RISKS FOR COVID-19 PATIENTS

- Potential risks of therapy remain unknown. US FDA rules say suitable donors are those whose infection began 28 days prior
- A study from Wuhan published in March showed that 10 adults who were severely ill with Covid-19 tolerated the transfusion well and started developing antibodies that helped reduce the viral load within seven days



Mechanism of action of plasma therapy:

The antibodies present in (i.e. “immune”) plasma possesses salutary effect and mediate therapeutic action via various mechanisms. Antibody has a special ability to bind to specific pathogen and hence, antibody is able to directly neutralize the infective nature of any pathogen. On the other hand, other antibody-mediated pathways such as γ -dependent cellular cytotoxicity, complement activation, or phagocytosis may also contribute to its therapeutic effect.

Convalescent plasma can be assembled swiftly using the established blood collection and transfusion infrastructure. Specifically, convalescent plasma is obtained and administered using standard collection and transfusion practices that are available around the world.

Convalescent Plasma in treatment of CORONAVIRUS:

Convalescent plasma has been used in 21st century in two other Corona virus epidemics i.e. SARS1 in 2003 and MERS in 2012 to the present. Knowledge from those outbreaks illustrates that convalescent plasma includes neutralizing antibodies. Hence, this can be used as potent treatment against viral infection. The current pandemic also deals with the convalescent plasma study to treat patients in China suffering from COVID-19. The pilot study of 10 patients with severe COVID-19 was done and the investigators collected convalescent plasma with neutralizing antibody titers at or exceeding a 1:640 dilution. No serious adverse effect in the recipients was found in Transfusion of convalescent plasma. All the patients had improved in symptoms i.e. cough, cold, chest pain and shortness of breath within 1-3 days of transfusion; they also demonstrated radiological improvement in pulmonary lesions.

The risks of COVID-19 infection are thoughtful. The increasing cases of positive people are considerable. In this scenario, human plasma from improved COVID-19 patients is anticipated to be potentially effective and a safe therapy for treatment and post-exposure prophylaxis alike. Plasma transfusions also improve clinical condition and decrease mortality rates. Substantial evidence of benefit with prior use for viral infections offers strong precedent for such an approach. However, a controlled clinical trials are always mandated to determine its efficiency and exact role in treatment of Novel corona virus.

COUNTRIES THAT HAVE TRIED PLASMA THERAPY FOR COVID-19



COVID-19 VIRUS