Convalescent plasma therapy was a treatment used in the past by taking advantage of the bodies ability to produce anti-bodies. The idea behind this potential treatment was that people would be given a blood transfusion from someone who had developed the anti-bodies for COVID-19 or any other virus. With the antibodies for COVID-19 within your system you would be able to fight off the virus if you had it to a degree of severity where emergency use was needed with little to no symptoms. However, there is an extremely high survival rate when it comes to COVID-19 but amidst the height of the pandemic the emergency use was necessary.

Abstract

Convalescent plasma therapy was a treatment used in the past by taking advantage of the bodies ability to produce anti-bodies. The idea behind this potential treatment was that people would be given a blood transfusion from someone who had developed the anti-bodies for COVID-19 or any other virus. With the antibodies for COVID-19 within your system you would be able to fight off the virus if you had it to a degree of severity where emergency use was needed with little to no symptoms. However, there is an extremely high survival rate when it comes to COVID-19 but amidst the height of the pandemic the emergency use was necessary.

Background & History

- An Italian man named Francesco Cenci was the first to use convalescent serum as a therapeutic tool to help children combating measles.
- Convalescent plasma therapy has been known to be used to treat influenza A.
- During the pandemic there was an emergency use authorization given by the FDA (Food and Drug Administration) for the treatment of hospitalized patients. They wanted patients that had been infected with COVID-19 to provide antibodies. These provided antibodies would then be used as part of a treatment for already infected COVID-19 patients.

Chemical Components

- COVID-19 Antibodies:
  - IgG
  - A monomer, with two different antigen binding sites
  - IgM
  - A pentamer, with ten different binding sites

Source/Production

The main components are made through the processes of your immune system. Once infected with the virus, the antibodies start to build. The antibodies then attach themselves to SARS-CoV-2 in the new patient and try to neutralize the virus.

Administration

The treatment is done by blood transfusion:
- Taking the blood of someone who previously had COVID-19 and giving the plasma (containing the virus antibodies) to someone currently infected with the virus to teach them how to make COVID-19 antibodies.
- The antibodies would help fight off the virus.
- In this type of therapy, you would need two blood transfusions.
- A transfusion of one unit of platelets takes about 30-60 minutes.

Effects on the Body

When first infected with COVID-19 the symptoms your body experiences are fever or chills, cough, shortness of breath, fatigue, muscle or body aches, headache, sore throat, and diarrhea. The patient develops antibodies to the virus which help them recover.

The plasma from a recovered patient containing the antibodies is transfused into a new patient with the virus through convalescent plasma therapy.

Important Statistics

This graph depicts the outcomes of 39 patients who received convalescent plasma transfusions at a single center, The Mount Sinai Hospital in New York City. It was administered to people who were very ill and showing signs of life failure. The survival probability was held at 80% after being treated which is about 30-50% higher than the patients who did not receive the therapy. According to Elsevier Public Health Emergency Collection a patient recovered within 12 days of the transfusion therapy. This study looked at 19 patients who received the treatment and lowered their mortality rates and shortened their hospital stay.

Conclusion

Convalescent plasma therapy has been used for many years being traced all the way back to 1907 when it was used for measles. The emergency use of the therapy for COVID-19 has impacted the lives of many. However, health care professionals would not consider it a sound solution for how big of a health crisis COVID-19 is. Antibodies do help teach the body how to build up its own protection to the virus and vaccines are a better long-term solution. With everyone being able to fight off COVID-19 on their own we can live in a world where coronavirus is not a threat.