

# Chapter 8

## Plasma Therapy Towards COVID Treatment



Apart from the drugs used in the treatment of COVID, it is necessary to try several other routes through which the recovery of the victims can be made possible. India has now laid its steps towards implementing the Plasma Therapy as an approach towards the treatment of COVID19. Here the Plasma is collected from the individuals who have recovered from the infection, as they have already developed antibodies against the pathogen. The plasma from these individuals is expected to contain antibodies against COVID which can be used further for treating the patients affected with this pathogen.

Plasma is a liquid portion of the blood that contains 90% of water and 10% of blood proteins [1]. These blood proteins mainly include antibodies, coagulation factors, serum albumin etc. The plasma of the blood can be easily separated as the supernatant by simple centrifugation of the whole blood [2]. Being highly rich in proteins and immunoglobulins plasma can be a better choice for the treatment of such diseases which do not have a perfect medication and solution. Many of the rare chronic conditions are treated with blood plasma. Plasma has been termed as a Gift of Life by some of the health organizations [3]. The concept of plasma therapy was first practically performed in the year 1982. In order to treat Diphtheria serum was collected from the animals and used for the therapy. This is a successful protocol with some mild side effects also been observed. The plasma obtained from the COVID recovered individuals who have developed the antibodies is transfused into the patients to be treated. These injected antibodies impart passive immunity to the patient.

However the chances of success are not 100% as some of the cases even revealed an elevation of infection rather than recovery. In case of dengue the use of convalescent serum has failed to provide immunity rather it had enhanced the virus replication in the host. Apart from the pathogen that is targeted in the Plasma therapy there are chances that a new pathogen may enter the victim along with plasma used for therapy causing other infections.

## 8.1 Assessing Global Success Rate of Plasma Therapy

Wuhan, China demonstrated successful results of Plasma Therapy where in 10 adult individuals with severe COVID Infection were subjected for plasma transfusion. Within the duration of 7 days antibodies were produced and the patients' viral load could be reduced successfully.

In case of US on March 28th 2020 a first clinical trial was conducted from the Houston Methodist Hospital where in the plasma from the blood of the COVID infected and recovered individuals was collected and transfused to the patients to be treated.

In one of the research study published in an American Journal of Pathology, the clinical outcome of the plasma transfusion for the treatment of COVID was explained. 25 patients were considered for the study among which 19 individuals exhibited a good improvement in the clinical condition with the treatment and 11 individuals could successfully be discharged from the hospital. However a concrete conclusion regarding the treatment protocol can be made only after randomized clinical trials with the large study population [4].

Recent study related to the Plasma Therapy also revealed its significance in treating previously encountered infections like SARS Pandemic in 2003, H1N1 Influenza pandemic in 2009 and most recently in 2015 the outbreak of Ebola in Africa. All these cases exhibited a good percentage of Plasma Transfusion success rate.

## 8.2 Plasma Therapy Guidelines and Significance in India

As a preliminary step towards the current treatment for COVID 19, India is striving to implement this system of treatment. The trials related to Plasma therapy have started in Maharashtra, Uttar Pradesh and Madhya Pradesh [5]. In particular to the Plasma therapy for COVID 19, FDA states that the donors selected for the Plasma collection should be infected 28 days prior to the plasma collection. In order to donate the plasma for the treatment the individual should be recently recovered from the COVID. There are certain parameters laid by ICMR for an individual to donate the plasma. The plasma donor should have possessed both cough and fever as symptoms during COVID infection and cannot be asymptomatic.

A recent report released by Hindustan times, Thiruvananthapuram- 17th June 2020 [6], reported a success case of Plasma Therapy in treating the COVID19 victim. Dr. MA Andrews, principal, Thrissur Medical College reports that one of the patient who returned from Delhi and facing worsened health condition was kept on ventilator support for 6 days. His worsened condition was than treated by Convalescent plasma therapy by administering the plasma obtained from the recently recovered patient of COVID. The results were successful and the patient was successfully transferred to ICU from ventilator. This was a first successful case treated with Plasma therapy in

the state. This case report may be a better example to implement plasma therapy as an approach to treat COVID.

Another report released by Times of India on June 7th 2020 [7], states that Plasma therapy proved to be successful in treating a COVID patient in Kolhapur. Chatrapati Pramilaraje (CPR) Hospital has achieved success in treating a COVID patient with plasma therapy by administering the plasma containing antibodies against COVID pathogen. The plasma was obtained from the pre infected patient with COVID who has recovered in the month of April and thus developed the antibodies against Novel Corona Virus. The plasma collected is injected into the blood stream of the target patient to be treated. District collector Daulat Desai claims it to be the first successful Plasma Therapy in Kolhapur and also stated that the patient who was treated reported to be negative for COVID, thus can be a better hope for the treatment towards COVID victims.

The article also reports that Plasma Therapy is approved by the Central Government to treat critically ill and morbid patients. Also some of the recovered patients extended their interest in donating the plasma to be used for the treatment so as to maintain the plasma Stock.

Department head, PGIMER, states that the patients who do not develop fever during COVID 19 will not respond to the infection [8]. PGIMER, Chandigarh, has started the Clinical Trials for COVID and even after 3 weeks of the beginning of Clinical trials of convalescent plasma use in the patients who are critically sick, only 5 donors were selected due to the limitations and parameters proposed by ICMR. All the individuals who were asymptomatic for COVID infections are unfit for donating the plasma.

Prof Ratti Ram Sharma who is the head for the Department of Transfusion Medicine at PGIMER reported that most of the patients are asymptomatic and cannot be used for plasma donation and research. Many of the patients failed to qualify the rules of ICMR. Mohali and Jawaharpur patients were also contacted to be the donors for plasma but all the cases are asymptomatic and cannot be used. The major reason is that the patients who did not develop fever during infection fail to develop antibodies and thus cannot qualify as plasma donors (Fig. 8.1 and 8.2 and 8.3).

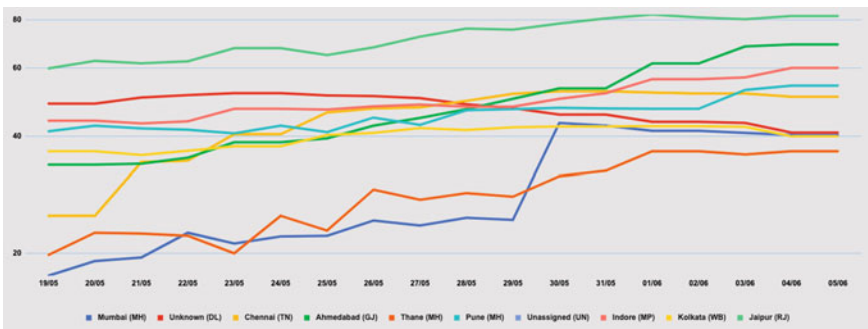


Fig. 8.1 Time series of recovery rate percentage of top ten districts by total infected

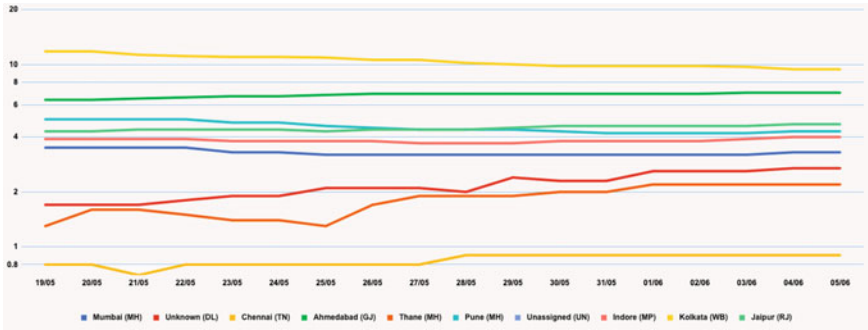


Fig. 8.2 Time series of fatality rate percentage of top ten districts by total infected

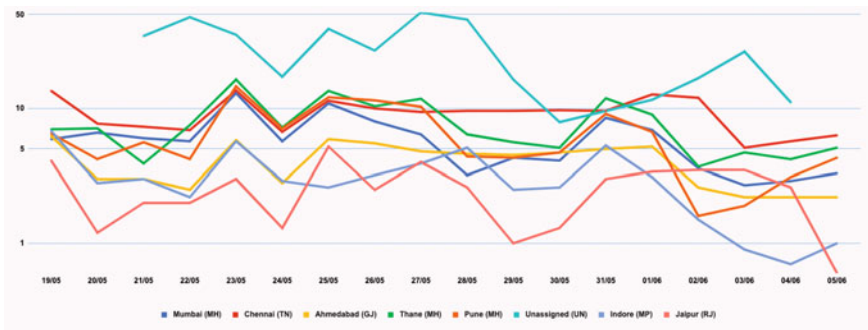


Fig. 8.3 Time series of growth rate percentage of top ten districts by total infected

### References

1. COVID-19 Convalescent Plasma Program American Red Cross Blood Services, <https://www.redcrossblood.org/donate-blood/dlp/plasma-information.html>
2. Carmona S et al Separation of plasma from whole blood by use of the cobas plasma separation card: a compelling alternative to dried blood spots for quantification of HIV-1 viral load. J Clin Microbiol. <https://doi.org/10.1128/jcm.01336-18>
3. "Plasma Therapy For Covid-19", Siddha Spirituality for Health, April 27, 2020, <https://siddhaspirituality.com/plasma-therapy-for-covid-19/>
4. New, Covid-19 plasma therapy safe, without adverse side effects: Study, Health News, Health world.com, June 3rd 2020
5. News, Covid-19: What is plasma therapy? Times of India, April 30, 2020
6. News, "Kerala: Covid-19 patient recovers after he was administered plasma therapy" Hindustan Times, June 17, 2020
7. News, "First plasma therapy for Covid-19 successful in Kolhapur", Times of India, 7 June 2020
8. News, "Asymptomatic patients pose challenge at clinical trial of plasma therapy at PGI", TributeIndia.com, May 30, 2020