

Safety of Donor and Recipient in COVID-19 Pandemic

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Abstract

Novel corona virus is a new strain of corona virus family, caused by SARS-CoV-2, probably of bat origin, not previously identified in humans. The time between entry of virus in body and start of first symptoms is the incubation period of the disease. For COVID-19 the incubation period is from two days to fourteen days. COVID-19 disease spreads through small droplets from nose and mouth. Spread is also through skin contacts and even through air while speaking. Blood is an integral part of the healthcare system. During the COVID-19 pandemic blood transfusion services were affected worldwide. The blood transfusion service had to face many challenges also in India. Voluntary blood donation was decreased which is the main source of blood and blood components. In lockdown, problems of transport services, less staff, fear of getting infected all these factors affected the blood donation services. This pandemic has influenced the blood donation activities causing shortage of blood and blood components and thus affected the blood inventory. Hence the blood services had to make appropriate plans to meet the requirements of patients.

Keywords: Blood Transfusion Services, Blood Inventory, Corona Virus, Pandemic, Voluntary Blood Donation, COVID-19

1. Introduction

COVID-19, the Corona virus disease is a worldwide pandemic. In Wuhan China, many patients of severe lower respiratory tract infection whose cause was unknown were revealed in December 2019. Causative organism for the outbreak was named as Novel Corona virus by the 'National Health Commission (NHC) of The People's Republic of China'. World Health Organization (WHO) called the disease as COVID-19. Till 2nd March 2020, 80302 cases and 2947 deaths of COVID-19 were confirmed. 10449 cases and 170 deaths were from outside China¹. World health organization (WHO) declared outbreak in March 2020 and India declared Nationwide lockdown on 24th March 2020².

SARS, MERS-COV have caused disease in humans along with morbidity and mortality related to infection during past 20 yrs³.

This coronavirus caused pneumonia like symptoms in many patients within short period of time. Disease spread rapidly and was declared as global pandemic 3 months after the first confirmed case.

2. Background

Novel corona virus is a new strain of corona virus family, caused by SARS COVID 2 probably of bat origin, not previously identified in humans. The time between entry of virus in body and start of first symptoms is the incubation period of the disease. For COVID-19 it is

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from two days to fourteen days^{2,3}. Human to human transmission through small droplets from nose and mouth is known³. Spread is also through skin contacts and even through air while speaking⁴.

Some individuals are asymptomatic and others have mild to severe symptoms. Common symptoms which most of the patients show are runny nose, fever, sore throat, dry cough, nasal congestion, chills, tiredness, muscle pain, headache, chest pain and breathlessness. Other common symptoms are nausea, vomiting, diarrhea, skin rash, delirium and dizziness. Patients may present with early symptoms like loss of smell or taste^{2,3}.

Among the symptomatic, one sixth patients experienced serious symptoms³. Severe cases presented with lower respiratory tract infection which progressed to critical status such as acute respiratory failure and thromboembolism due to cytokine storm and patients needed ventilator support.

In many patients, severity of the disease increased after a week after the first symptoms were noticed.

Elderly persons with weak immune system and having co-morbid conditions such as asthma, diabetes, hypertension, chronic lung disease presented with more severe symptoms. Smokers, patients with weakened immunity due to sickle cell disease, organ transplantation or cancer have more severe symptoms. Acute respiratory distress syndrome, bacterial infections, shock due to septicemia, cardiac complications, kidney failure, GI bleed, polyneuropathy are complications of COVID-19 and leading to mortality in some patients⁴.

In rare cases, patients who had recovered after being positive for COVID-19 infection, presented with repeat infection².

Pediatric age group patients presented with similar symptoms to adult patients but in milder forms only.

3. Challenges Faced by Blood Bank Services

Blood is integral part in healthcare system⁵. During this difficult time, blood establishments were affected worldwide. The blood bank in our nation also had to face many challenges.

Voluntary blood donation was decreased which is the main source of blood and blood components.

In Lockdown, problems of transport services, less staff, fear of getting infected all these factors affected the blood donation services.

This pandemic has influenced the blood donation activities causing shortage of blood products affecting its inventory^{5,6}. Hence blood services had to make appropriate plans to meet the requirements of patients⁶.

Blood is critical resource for patient, so blood establishment must maintain 24/7 operation to provide service to needy patients as blood is a lifesaving treatment. Hence measures had to be taken to avoid the incidence of less or no blood supply especially who require frequent transfusions such as patients with sickle cell anemia, thalassaemia, and also to patients with road traffic accidents, postpartum hemorrhage, carcinoma and emergency surgeries.

Measures were made by the blood transfusion services to maintain the blood stocks by inviting donors by phone calls, encouraging in house donation. National guidelines were established by SBTC and FDA India and strictly followed by blood bank services. Blood cannot be manufactured and there is no substitute for blood other than human blood donation, hence regular volunteer donors must be encouraged for donation⁵. Standard operating procedures were prepared about blood donation criteria during COVID-19 pandemic and about handling of blood samples of COVID-19 patients who required blood.

WHO released guidelines for provision of safe blood and to avoid the blood shortage in this pandemic⁷.

Hemovigilance reporting in Greece suggested no transmission of COVID-19 through blood transfusion¹⁰. According to the study by Korean Red Cross blood services, no post transfusion transmission was reported³. There are no reports of spread of respiratory viruses from transfusion of blood products^{6,9,10}. Hence no additional measures, have been suggested by CDC, US FDA, American Association of Blood Banks (AABB)³. COVID-19 is an enveloped virus and is vulnerable to get inactivated and removed, as it goes through multiple steps during the procedure involved in preparation of plasma derivatives⁶.

However the study conducted in China showed that virus was identified in 4 out of 5000 blood donors³. Hence precautionary measures for donor selection and donor deferral must be taken by blood services along with donor

education as asymptomatic infected donor can infect other donors and staff⁹.

4. Factors which cause adverse effects on blood donation are¹¹

The important message of the lockdown was “Stay Home Stay Safe”¹².

Blood donors and organizers of blood donation camps were afraid of contracting COVID-19 which led to shortage of blood inventory worldwide.

Due to closure of universities which are main source of voluntary blood donors, number of blood donors was decreased.

Due to lockdown and social distancing, it was difficult for voluntary blood donors to reach the blood banks.

Considering this scenario, guidelines were given by Ministry of Health and Family Welfare Government of India, State and National Blood Transfusion Council.

Following are the clinical and epidemiological criteria for deferral of at risk donors³

- One or more clinical finding such as rhinitis, cough, shortness of breath, radiological findings of pneumonia¹³.
- Confirmed case: The person with positive RT-PCR report, discharged from hospital or in home isolation, should be deferred for 28 days. (The term “end/home isolation” should be as per the guidelines provided according to Ministry of Health and Family Welfare)
- Contact case: History of close contact with laboratory confirmed patient or suspected cases in quarantine.
- Travel history: Persons having history of travel from a country with spread in community or any area declared by Government authorities.
- Following recommendations are given for maintenance of blood chain in light of COVID19³
- For the safety of staff, donors and recipients proper communication is important. For this, disaster management committees, donor and product safety committee, medical staff, laboratory staff and transportation staff must be aware of the precautions and safety measures. It is the duty of blood bank services to communicate with donors, camp organizers about the measures taken^{8,14}. This needed good communication with clinicians for best utilization of blood components.
- Blood collection van can go door to door for voluntary blood donation¹⁵.
- For adequate maintenance of blood stock, in house blood collection and outdoor blood donation camps should be encouraged. Blood bank staff, camp organizers, potential blood donors and concerned authorities should take responsibility for the same.
- Training was given to healthcare staff involved in cleaning of blood banks. They were instructed to clean blood bank premises, door handles, surfaces of furniture, computers, chairs, writing material etc. using hypochlorite solution three times a day. Appropriate cleanliness of equipments used for blood collection should be done.
- Blood donation camps can be arranged in small batches in staggered manner by informing donors telephonically about time for donation to avoid overcrowding¹⁶.
- Norms of social distancing should be applied strictly during the camps, keeping distance of at least one meter in two donor chairs during donation and post donation refreshment. Only 5 to 6 blood donation chairs should be allowed at blood donation camp. Donor chairs were sanitized before and after each donation. Use of squeezing balls during blood donation was avoided.
- Activities such as hand shaking, hugging to be avoided with strict maintenance of regular hand sanitization. Hand should be disinfected regularly using soap and water for minimum 20 seconds or sanitizer containing 60% alcohol². Every time before touching eyes, nose and mouth, hand should be cleaned properly. Strict maintenance of cough etiquettes should be followed.
- Donor education materials should be displayed. Donor education materials include leaflet, handouts or posters about blood donation motivation along with “who should donate blood and who should not”¹¹.
- Preliminary screening of donors was done telephonically to avoid unnecessary travel to blood bank in case of deferrals. Selected donors were again screened after arrival for donation.

- Age, sex, weight, temperature, blood pressure, pulse, hemoglobin level, medical and travel history should be taken into consideration to safeguard against the spread of infection. Advice was given to elderly donors to avoid blood donation in this period as there is increased risk of transmission to elderly persons^{17,4}.
- If donor is not well, self deferral was advised. Temporarily deferred donors were motivated to donate the blood after completing his/her deferral period¹².
- It is mandatory for the blood donors to wear mask however protective gloves for donor is not compulsory.
- Appropriate use of N 95 mask, additional gloves, gowns and sanitizers can be used as personal protective measures for blood bank staff though voluntary blood donors are generally healthy.
- Safe waste disposal of used gloves, masks, caps and other soiled material³. COVID-19 waste must be handled carefully to avoid spread of infection. Sodium hypochlorite solution is used in appropriate concentration for disinfection of COVID-19 waste¹⁹.

The existent Biomedical Waste Management Rules 2016 as per Government of India, Ministry of Environment, Forest and Climate Change applies separation of biomedical waste in color coded bags and bins. Amendments were done in 2018 for enforcement of rules²⁰.

In view of COVID-19, new guidelines are issued by Indian Central Pollution Control Board (CPCB) WHO, US Occupational Safety and Health Administration (OSHA), Maharashtra Pollution Control Board etc for management of safe disposal of COVID-19 waste²¹.

- Post donation refreshment should be offered in wrapped snacks and drink. In many cases electronic devices were used to give certificates to the donors.
- To manage the blood supply for the patients, transfer of the blood components to other blood banks who had less blood stock was considered.
- Donors were informed to communicate to blood banks in case he/she develops any symptoms after blood donation. Blood bank in such cases should

confirm that it is post donation and take follow up. The treating consultant and hospital authority should be informed if the blood of such donor has been already transfused to the patient³.

In our institute, Dr. Vasantao Pawar Medical College Hospital and Research Centre blood bank, standard operation procedures were made considering the above guidelines and is being followed meticulously. Work was done with minimum staff at one time.

All blood bank staff was advised to download Arogya Setu app which is a mobile application developed by the Government of India to connect essential services with the people of India in this pandemic.

The blood testing procedure of the blood bank is carried out in Biosafety cabinets.

National blood policies should be followed to avoid wastage of blood. Stringent criteria for ordering of blood transfer of blood components and to maintain the stock should be followed.

Blood in hospital should be ordered only if it will be used. If the volume of the platelets is divided into two platelet units it can add to the platelet stock. All testing of blood units can be done in biosafety cabinets. Testing for transfusion transmitted infections should be done as per routine. Pathogen Reduction Technologies (PRT) although known, is not readily available and is costly³. After issuing of blood, transfusion should be started within 30 minutes and completed within four hours²².

5. Conclusion

Blood bank service is considered as an integral part in medical field.

Blood stock should be maintained to meet the requirements of patients and provide safe blood to the needy. Blood establishments should make plans and policies accordingly to overcome such situation by following guidelines set by the Government regulatory authorities.

Blood bank personnel must be trained to understand the infection threat and follow public health guidelines to avoid risk to health care workers and donors by following safe blood transfusion practices.

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