



## CHALLENGES AND RESPONSES BY REGIONAL BLOOD TRANSFUSION SERVICES IN NORTH WEST INDIA DURING COVID-19 PANDEMIC

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### ABSTRACT

**Introduction:** The COVID-19 pandemic is the biggest pandemic of the 21st century, affecting 216 countries, over 80 million people and more than 17 lacs confirmed deaths across the globe as of end of the August. To prevent the community spread of the SARS-CoV-2 virus, the Government of India announced national lockdown which affected the blood transfusion services also. There are around 3000 licensed blood banks all over the country, In this situation the major challenge for blood transfusion services was to maintain adequate and uninterrupted blood supply in a tertiary level multi-specialty hospital.

**Material and Method:** The retrospective study was done in tertiary care hospital included challenges faced by Blood transfusion services and responses to overcome those challenges by the Blood transfusion services in COVID-19 pandemic crisis. A comparative analysis of Blood donations was done from January to August month with the previous year donations.

**Results & Discussion:** In month of January and February the total blood donations were more in Pandemic year (2020) than previous year (2019). In March when 1st confirmed case of COVID-19 detected in Rajasthan, the percentage of blood donations decreased to 70.4% in month of March. After announcement of lockdown, blood donations reduced drastically and remain 20.1%, 31.9%, and 20.7% respectively in months of April, May, and June in comparison to previous year donations in these months. After shifting of COVID-19 facilities to another separate hospital and phase wise steps of Unlock by the government the percentage increased in month of July and August up to 63% and 70% respectively.

**Conclusion:** In COVID-19 pandemic blood centres required coordination right from government authorities to directly to the public. BTS should have their own strategic plan to deal with challenges faced during pandemic and should respond promptly.

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### INTRODUCTION

Outbreak of pneumonia was reported in the city of Wuhan (China) which on 7 January 2020 was identified and named as severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) that belonged to corona virus genus of Coronaviridae family.

On 11 March 2020, the World Health Organization (WHO) declared SARS-CoV-2 outbreak as a pandemic and named it as COVID-19<sup>1</sup>.

The COVID-19 pandemic is the biggest pandemic of the 21st century, affecting 216 countries, over 80 million people and more than 17lacs confirmed deaths across the globe as of end of December2020.

In India by the end of December the disease affected 10 million people over the country and more than 1.4lac deaths across the country. In view of state of Rajasthan, the disease

affected around 3 lacs patients and over 2thousand deaths across the entire state. During this pandemic India has gone through many facets of lock-down and unlocks.

The COVID-19 virus outbreak is primarily transmitted by the respiratory route. Risk of transmission of COVID-19 through transfusion of blood and components is now only theoretical and likely minimal. But experience with outbreaks of other coronaviruses suggests that there will be significant impact on blood supplies through reduced blood donation.<sup>2-4</sup>

The overall case fatality rate is estimated to range between 2% and 12%.<sup>5-6</sup> Virus detection in blood has not yet been established as per a study on 41 cases of COVID-19 in Wuhan, where only 6/41 (15%) of the patient's blood samples were positive for SARS-CoV-19<sup>7</sup>. Also, viral RNA was detected in the serum of only 1 of 5 infected symptomatic family members<sup>8</sup>. The virus has mostly been detected in blood serum of symptomatic patients on the 2nd to 3rd day of onset of

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symptoms. But, in a retrospective study by Chang *et al.* on 4995 blood donations by asymptomatic donors tested for COVID-19, viral RNA was detected in plasma samples of 4 donors stored at 2-8°C for 28 days<sup>9</sup>. This implies a potential risk of transfusion transmissibility of COVID-19 from asymptomatic or pre-symptomatic donors who donate blood<sup>10</sup>. Various Containment steps has been taken by the government of India as well as state governments to prevent community spread of COVID-19 in India.

Since Study center is largest hospital of north west india which has multiple super specialty units, cancer centers as well as organ transplant centers which require huge number of blood/ blood component units. Study center is a regional blood transfusion center, 6 blood banks and 8 storage centers are attached to the Department of Transfusion Medicine. Around 500 thalassemic children are registered in hospital those required frequent blood transfusions. So it was important to effectively manage blood transfusions service here. Blood bank faced lots of challenges during COVID 19 pandemic crisis to maintain adequate and uninterrupted blood supply.

Above study does not contain any patient Identifiers, ethical approval was not required.

## RESULTS & DISCUSSION

The first confirmed case of COVID-19 was detected on 30 January 2020 in India's Kerala state. In month of January and February the total blood donations were more in Pandemic year (2020) than previous year (2019). In March when 1<sup>st</sup> confirmed case of COVID-19 detected in Rajasthan, the percentage of blood donations decreased to 70.4% in month of March. After announcement of lockdown blood donations reduced drastically and remain 20.1%, 31.9%, and 20.7% respectively in months of April, May, and June in comparison to previous year donations in these months. After shifting of COVID-19 facilities to another separate hospital and phase wise steps of Unlock by the government the percentage increased in month of July and August up to 63% and 70% respectively (Table-1).

### Challenges to blood transfusion services

#### Reduced availability of blood donors

Number of blood donors drastically decreased because of fear of becoming infected during blood donation. Another major cause of reduced donations was difficulty of donors to reach blood centers / outdoor camps due to lockdown situation. As the Jaipur city was declared as containment zone because of huge no. of COVID-19 patients, the permission from authorities like administration/ police was made mandatory to organize a VBD camp so it was quite difficult to blood donation organizers to obtain permission by authorities.

#### Management of inventory

Inventory management became big task during pandemic as Routine OPDs were completely shutdown. All routine surgeries have been suspended, so demand of blood component also decreased, that results increase in wastage because of shorter life span of near expiry blood / blood components. Fresh blood requirement of blood for certain patients as thalassemia, blood cancer patients it was very difficult to follow FIFO (First In First Out) policy in a proper manner.

### Staff management

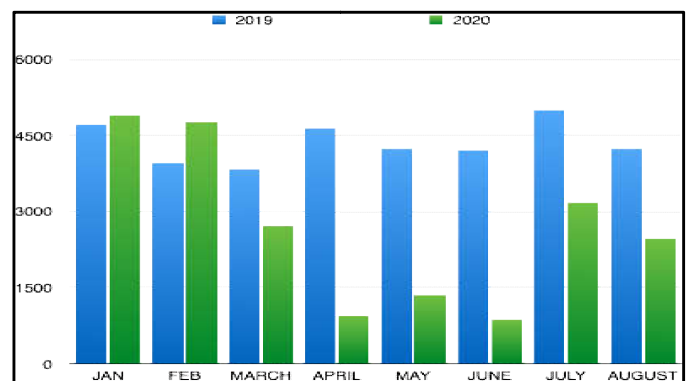
Staff who comes from outstations faced difficulty due to complete lockdown because of public transport closure. Keep the staff spare from infection was another major task too, designated staff required for COVID-19 sample handling, and transfusion related work up for covid-19 samples that again leads to deficiency of staff in emergency

**Logistics issues:** Decreased supply of consumables because of lockdown of trades as well as expiration of reagents and consumables.

**Table 1** Comparison of Blood donations from previous year

SN	Month	Total Donations (Year)		Replacements		Voluntary	
		2019	2020	2019	2020	2019	2020
1	Jan.	4704	4904	2827	2574	1877	2150
2	Feb.	3964	4750	2596	2870	1368	1880
3	March	3836	2703	2581	2115	1255	588
4	April	4625	931	2856	367	1769	564
5	May	4254	1361	3374	492	880	869
6	June	4206	871	3423	377	783	494
7	July	5010	3187	3578	2149	1432	1038
8	August	4259	2464	3295	1821	964	643

Blood transfusions services were drastically affected during COVID 19 pandemic crisis, blood donations reduced up to 80% in lockdown phase than previous year donations (A comparison is made in table-1)



**Graph 1** Month wise comparative analysis of blood donations

### Responses of blood transfusion services to COVID-19

#### Healthy donor recruitment in crisis

Donor motivation programme were operated via social media (Facebook, Whats App etc.), in local news papers, Electronic media etc. Special permission from state government administrative authorities were taken to organize outdoor blood donation camps in blood mobile van. Some NGOs / organizers played an important role in pandemic; they organized VBD camps in groups of 10-15 maintaining social distancing. Pre registration of donors were done and called them into small groups 2-3 donors at a time.

Special screening or deferral criteria was followed according to NBTC guidelines in pandemic<sup>11</sup>.

Regular repeat voluntary blood donors are usually safer and more faithful than first-time donors, so blood centers contacted them to donate during the crisis. Blood center contacted their voluntary blood donor organizations and defense service personnel like political party's organizations, Staff of educational institutes, defense like BSF, social organizations etc.

Blood donors were encouraged for self-deferral in case of doubt of symptoms or history of contact with infected persons<sup>12</sup>. Blood donors were also advised to report back to the blood center within 14 days of donation if they are symptomatic or confirmed positive or have been in a close contact with confirmed positive individuals. If they did, the unutilized blood collected from such donors is discarded with proper documentation.

### **Role of voluntary blood donation organizations**

All Voluntary Blood donor Organizer have been approached to sustain constant inflow of donors. The role and responsibilities determined in synchronization with the existing rules and regulations for mass gatherings and social distancing measures to be undertaken and as communicated by the concern authorities during the epidemic period while conducting the VBD camp. Some VBD organisations held daily camps in groups of 10-15 donors daily in mobile blood vans with maintaining social distancing as well as proper sensitization techniques.

### **Inventory managements**

Orientation of clinicians was done to limit the transfusion / appropriate use of blood or blood components. Use of alternatives to blood transfusion were provoked. Daily physical stock was maintained with their expiry date. Bulk transfer to other associated / licensed blood centres was done. FIFO policy was strictly followed with daily physical verification of stock.

Near expiry blood was shifted to associated blood banks as well as accepted from them according to need/ demand. Compatible Blood group substitute was issued to reduce wastage after consenting from clinicians.

### **Infection control measures**

Blood collection centers are not medical care facilities so general public guidelines rather than hospital guidelines could be followed. Consistent with national and state communicable disease control guidelines for COVID-19 for communities.

Hand hygiene practices were rigorously implemented. Hand hygiene/hand washing trainings were organized<sup>13</sup>. Social distancing in all work areas as waiting hall, billing counters, laboratories donor screening, medical examinations and blood collection areas was maintained. Measures to reduced overcrowding in all areas staggering of blood donors were strictly implemented. No visitors in donor room were allowed. Separated Entry was made in hospital for blood bank to void close contact with confirmed or suspected case of corona virus disease.

Self deferral if a staff/donor was unwell or had contact with someone confirmed covid-19 case was motivated. Safe disposal of used gloves, masks, caps and other soiled material. Special attention was made for Proper cleanliness of equipment and their sanitization at frequent intervals. Donors were made aware of self deferral in case of felling unwell and reporting immediately to Blood Bank if COVID 19 related illness in 28 days of donation. Guidelines of use of masks were published/placed.

For Prevention of staff to get infected, adequate protective equipment were provided. Social distancing maintained, hand sensitizers were provided at all work stations as well as common areas. At blood centre requisition were accepted only

by hospital staff and telephonic coordination done with clinicians. Daily fumigation and 8 hourly senitization of entire blood bank was ensured<sup>14</sup>.

Another task was huge number of patients were admitted in the hospital so requisition of covid 19 patients received in Blood bank in view of that proper training to manage sample and discard were given to all staff of blood bank. SOPs were displayed at working area.

### **Management of consumables**

Done by shifting of tests to manual method instead of automation, as the number of donations were quite less than the usual. Acceptance of near expiry reagents from attached blood banks and combine testing of associated blood bank.

### **Guidelines for appropriate clinical use of blood and blood components**

Clinicians were sensitized and oriented for judicious/ appropriate use of blood and its components. Instructions were issued by medical superintendent to all clinical departments to restrict blood transfusion unless it is mandatory.

From June 1<sup>st</sup> Government of Rajasthan took decision to shift COVID-19 patients at some other site and the study site was declared COVID free hospital, routine OPDs were sustained gradually. This decision ended the fear of people coming to the hospital and blood bank that resulted increased in number of donations drastically 4times than May and June month.

### **Convalescent plasma therapy for covid-19 patients**

Convalescent plasma (CP) therapy, a classic adaptive immunotherapy, has been applied in SARS-CoV-2 infection, the anticipated mechanism of action by which passive antibody therapy would mediate protection is viral neutralization. Passive antibody therapy involves the administration of antibodies against a given agent to a susceptible individual for the purpose of preventing or treating an infectious disease due to that agent.

Our institute applied for COVID-19 convalescent plasma therapy trial after an invitation call from ICMR to participate in PLACID trial named "A phase ii, open label, randomised controlled trial to assess the safety and efficacy of convalescent plasma to limit COVID-19 associated complications" on April 12<sup>th</sup> 2020. Ethical approval was taken from institutional ethical committee for the generic protocol shared by ICMR. The generic protocol of ICMR was approved by drug controller general of India.

After grant of permission from ICMR permission to total of 44 patients enrolled under ICMR trial which included 22 in intervention arm and 22 in control arm. Institute and placid trial team was highly appreciated by ICMR team for doing exemplary work in screening, enrolling and treating patients. As per ICMR convalescent plasma has been termed as investigational therapy and can be use only on off label compassionate basis after careful evaluation of individual patient following ICMR criteria in moderate patients and after obtaining consent of patients.

After issuance guidelines by ministry of Health, Govt. of India, for off level use of plasma department of IHTM collected around 352 units of convalescent plasma after extensive COVID-19 donor counselling and recruitment programme and 332 units have been transfused to 288patients.

## CONCLUSION

Blood transfusion services plays a vital role in patient care as there is no substitute of blood so blood centers are committed for adequate and uninterrupted supply of blood and blood components. In COVID-19 pandemic blood centers required coordination right from government authorities to directly to the public. BTS should have their own strategic plan to deal with challenges faced during pandemic and should respond promptly so that the collection, processing, storage and supply of blood could be done regularly without any hindrance. Voluntary blood donor organizers are life line for any BTS and played major role to maintain uninterrupted blood supply to needy patients in this crisis. Blood center also played a major role in treating the patient by COVID-19 Convalescent plasma therapy.

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