

Impact of SARS-CoV-2 Pandemic on Blood Transfusion Services in a Tertiary Care Teaching Hospital Blood Centre in South India

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ABSTRACT

Introduction: Blood transfusion services (BTS) being an essential medical service should cater to the patient needs especially to those who are transfusion dependent. BTS faced numerous challenges to maintain the sustainability in service provision during the SARS-CoV-2 pandemic. Our aim was to study the impact of SARS-CoV-2 pandemic on blood transfusion services.

Material and methods: This retrospective cross-sectional study was carried out in the department of transfusion medicine in a tertiary care teaching hospital blood centre in south India. Data on blood collection, blood issues, wastage and number of blood donation camps was evaluated before and after COVID-19 i.e. from January 2019 to December 2020. The data obtained was tabulated and results were noted. Data were analysed using SPSS software version 21 for Windows statistical software package (SPSS Inc., Chicago IL, USA).

Results: There was a 52.4 % drop in blood donation, 54.5 % in blood component preparation, and 54.6% in blood issue during COVID-19. There was an increase in blood discard rate by 0.13% with double the rate of discards due to expiry of blood and blood components alone during COVID-19.

Conclusion: COVID-19 pandemic had a major impact on Blood transfusion services. Blood centres must make an emergency preparedness action plan to prepare and manage the blood supply during similar future threats based on the experience in this pandemic.

Key words: COVID-19, Blood donation, Discards

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INTRODUCTION

The novel coronavirus disease (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) began in Wuhan, China in December 2019. On 31st January 2020, the WHO announced the outbreak of COVID-19 as a public health emergency of International Concern and it has since become a pandemic [1].

COVID-19 has resulted in 112,696,510 cases and 2,497,594 deaths globally, affecting 199 countries [2]. In India, it has caused 11,030,176 confirmed cases, 10,726,702 recoveries and 156,598 deaths from COVID-19 (till 31st January 2021) [3].

On March 24, 2020, national lockdown was imposed in the country by the Government of India to contain the spread of virus [4]. Following this, there was a profound effect on blood transfusion services (BTS), including blood donation and blood supply. BTS being an essential medical service

should cater to the patient needs especially to those who are transfusion dependent like thalassemia, sickle cell anemia, and medical oncology patients. Hence the availability of safe and adequate blood and blood components is essential for the treatment of many patients and should remain uninterrupted amidst the pandemic.

The primary source of blood and blood components worldwide are mainly from voluntary non remunerated blood donors, blood donation camps and from patient's relatives [5]. However, BTS faced numerous challenges to maintain the sustainability in service provision during this period. If there is a lack of proper management of blood supply and demand, hospitals will face a shortage of blood resulting in the death or suffering of many patients unnecessarily.

In view of the above, we have analysed the impact of COVID-19 pandemic on blood transfusion services especially on blood donation, issues, number of blood donation camps.

MATERIAL AND METHODS

This retrospective cross-sectional study was carried out in the department of Transfusion Medicine attached to a tertiary care teaching hospital in south India. In this study, data on blood collection, blood issues, wastage and number of blood donation camps were evaluated before and during COVID-19 has started i.e. from January 2019 to December 2020. Data of all blood and blood components like whole blood (WB), packed red blood cells (PRBC), fresh frozen plasma (FFP), random donor platelets (RDP), single donor platelets (SDP) and cryoprecipitate were recorded. The data obtained was tabulated and results were noted. Data were analysed using SPSS software version 21 for Windows statistical software package (SPSS Inc., Chicago IL, USA).

RESULTS

The total number of blood donors donated during 2019 (pre covid-19) was 12,723 whereas during 2020 (during COVID-19), it was 6,664 blood donations. The trend of blood donation is shown in Figure 1. These donations were subjected for component preparation and accordingly, 28,866 blood components were prepared

during 2019 and 15,734 during 2020 which included WB, PRBC, FFP, RDP, SDP and cryoprecipitate (Table 1). The total number of blood issues in 2019 was 27,889 and in 2020, it was 15,222.

The percentage of decrease in blood donation, blood component preparation, and blood issue in 2020 was observed to be 52.4 %, 54.5 %, and 54.5%, respectively with respect to 2019.

The trend of blood issues is shown in Figure 2. The trend of issues of WB and PRBC, FFP and cryoprecipitate, RDP and SDP is shown in Figures 3 to Figure 5 respectively.

Out of 15,734 total blood components, 277 units (1.76%) were discarded in 2020 as compared to 473 units out of 28,866 in the 2019 (1.63%). There was an increase in wastage during 2020 by 0.13%.

A total of 32 voluntary blood donation camps were conducted in 2019 in which 1690 units were collected whereas 12 camps were conducted in 2020 wherein 487 units were collected. There was a drop by 62.5% in the number of voluntary blood donation camps during the COVID period.

Table 1: Comparison of data on blood collection, blood issues and discards during 2019 and 2020.

Year	Component preparation		Blood issues		Discards	
	2019	2020	2019	2020	2019	2020
Whole Blood	1170	181	1169	171	34	14
PRBC	11536	6430	11369	6168	174	86
FFP	11536	6431	10879	6239	233	97
RDP	4213	2421	4061	2361	122	79
SDP	17	53	17	56	0	1
Cryoprecipitate	394	218	370	227	0	0
Total	28866	15734	27889	15222	473	277

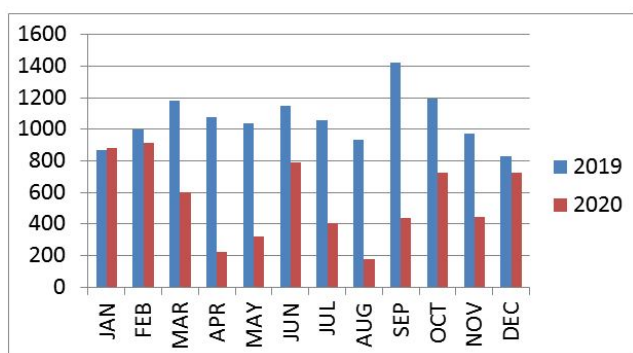


Figure 1: Comparison of trends of blood donations in 2019 and 2020.

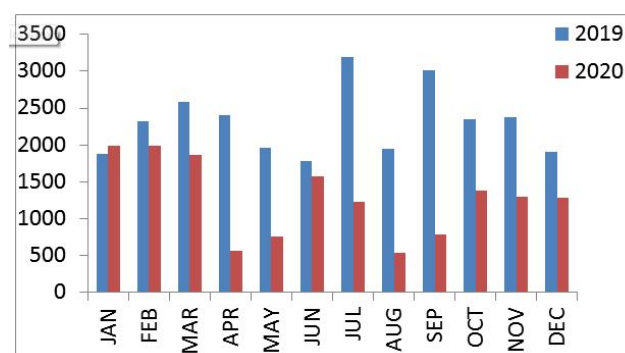


Figure 2: Comparison of trends of blood issues in 2019 and 2020.

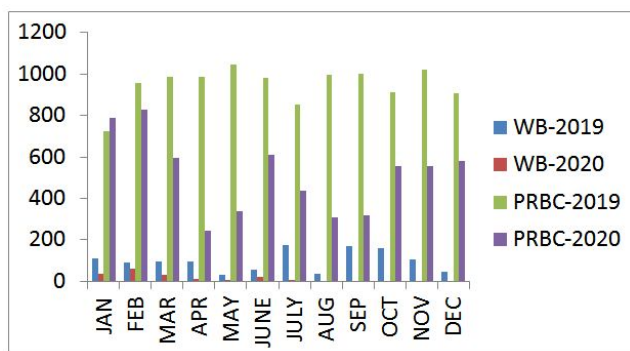


Figure 3: Comparison of trends of whole blood (WB) and Packed red blood cells (PRBC) issues in 2019 and 2020.

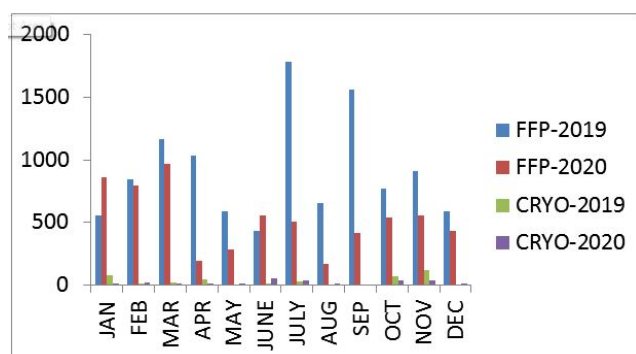


Figure 4: Comparison of trends of FFP and cryoprecipitate issues in 2019 and 2020.

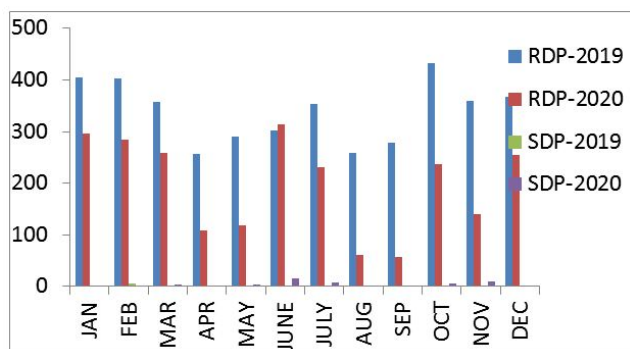


Figure 5: Comparison of trends of RDP and SDP issues in 2019 and 2020.

DISCUSSION

In our study, the blood donations dropped by 52.4% during the COVID period. The drastic decrease in donations started from April 2020 after the announcement of lockdown which increased during June 2020 due to conduction of voluntary blood donation camp. The drop in blood supply may be explained by the reduction in donors due to their fear of exposure to SARS-CoV-2 as well as decrease of voluntary blood donation camps due to closure of colleges and corporate offices. One study from Saudi Arabia observed a drop of 40.4% [6], whereas 64% was reported by Raturi et al [7]. Donor attendance in the USA and Canadian blood services fell by 10%–30% and 30%, respectively [8].

Fortunately, in our study, the drop in blood supply was balanced by the reduction in blood demand. There was 55% reduction in demand during COVID period. The decrease in blood demand was primarily due to decrease patient footfalls in the hospitals for treatment, closure of out-patient departments, decreased number of hospital admissions and cancellations of elective surgeries and reserving blood transfusions for emergencies only. Our report was in concordant with those reported by Yahia et al [6] and Sarita et al [9].

Due to decrease in blood utilization because of the above said reasons, there was an increase in the blood wastage. Though the increase in discard rate was 0.13% during COVID-19, the discard rate due to expiry of blood and blood components was 9.3% in 2019 which got doubled (18.3%) in 2020. This is in concordant with the study done by Divya et al [10]. Maintenance of block stock inventory poses a huge challenge to blood transfusion services due to shortage of blood components. Maintenance of buffer stock of blood and blood components along with rational use of blood and blood components by clinical staff will ensure proper utilization of blood and blood components.

There is a drop by 62.5% in the number of voluntary blood donation camps during the COVID period which is in concordant with the study done by Divya et al [10]. This could be due to avoidance of voluntary blood donation camps in view of the risk of community spread of the virus and due to prohibition of mass gatherings by the Government [11]. The psychological impact of COVID 19 and the public fear around blood donation needs to be addressed through awareness campaigns and social media.

SARS-CoV-2 transmission through blood transfusion has not been reported so far [12], and testing of donors or donated blood for SARS-CoV-2 was not recommended. However, blood centres were asked to take additional precautionary measures to minimize any chance for transmitting SARS-CoV-2 between the blood bank staff and donors and between donors themselves as there is still a theoretical chance of transmitting SARS-CoV-2 through blood [13]. Appropriate usage of personal protective equipment, physical distancing between the donors, checking donor body temperature, public health measures, and standard laboratory biosafety practices should be implemented as a precautionary measure which will be of much help in a long run, even in future similar outbreaks.

Blood centre should prepare an emergency preparedness plan to mitigate the potential shortage of blood supply and manage the blood transfusion services efficiently. They should also maintain a buffer stock of testing reagents and consumables as pandemics may affect the supply of those items in a timely manner.

CONCLUSION

COVID-19 pandemic had a major impact on BTS. Being an essential service, BTS should cater with utmost safety without any interruption. Blood centres must make an

emergency preparedness action plan to prepare and manage the blood supply during similar future threats based on the experience in this pandemic. There is a need to develop measures to manage blood supply shortage while ensuring recipient, donor and staff safety. In addition, there is a need to make the general population aware of the scientific precautions for donor attendance. The blood center team should always be prepared to adapt and implement new safety precaution practices even before guidelines are advocated by the national and state regulatory authorities and are bound to follow the guidelines.

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