Original Article

Impact of COVID-19 on Blood Transfusion Services and Strategies Used in Kerala

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Abstract

Background and Objectives: The ongoing COVID-19 pandemic is creating major disruptions globally at all levels of health care. The novel challenges affecting the efficiency of blood transfusion services range from uncertain patterns of demand for blood components to reductions in the numbers of donations and staffing because of lockdown and quarantine.[1] The authors attempt to evaluate the impact of COVID-19 on blood transfusion services and the strategies used in the state of Kerala. **Methods:** A Google Form questionnaire was framed and was sent across all the blood centres in the state of Kerala through e-mail and other social media platforms; taking into account the various strategies taken to ensure a safe blood supply. **Results:** Only 28% rvesponded. 85% had reduction in blood. 99% had a specific COVID screening questionnaire. 80% had thermal screening and frequent cleaning. 35% used disposable bed sheets and implemented a token/prior appointment system. Only 10% conducted donation camps. 76% had shortage of staff due to lockdown. 90% had a shift system in the form of work arrangement. 35% were not provided PPE as they had shortage. 57% had a reduction in their salary. Only 7% blood centres faced shortage in consumables. 23% had an increased wastage in blood components and a few reagents. Only 7.5% of the centres were involved in CCP collection. 99% of the blood centres were willing to be part of CCP collection if the need arises. **Conclusion:** The BTS is responsible to provide an uninterrupted blood supply and it requires coordination at every level. Staff safety in the form of PPE and security in the form of salary should not be deprived of as health-care workers are the main pillars in the fight against COVID-19. The BTS in Kerala responded to the pandemic by strictly following the NBTC guidelines. When the need arises, the infrastructure at various blood centres has to be utilized so that the treatment outcomes of COVID-19 are also improved.

Keywords: *BTS, convalescent plasma, COVID-19, Kerala, strategies*

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Introduction

Pandemic is defined as "worldwide spread of a new disease" (WHO) or "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people."[2] Previous pandemics taught us various lessons regarding preparedness of health-care services including blood transfusion services to deal with these outbreaks. The role of blood transfusion services in a pandemic depends on type of pandemic, potentiality of community spread and risk of transfusion transmissibility, and cost-effectiveness of blood safety interventions.[3] Nevertheless, every pandemic has its own set of challenges that cannot be handled with preplanned preparedness alone. There are more than 3000 decentralized blood centers all over the country of which 180 are in the state of Kerala. Kerala was the first

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state in the country to report the initial few imported cases of COVID-19 in students who returned from Wuhan.[4] The major challenges to blood transfusion services are recruitment of healthy blood donors, follow-up of donors and patients, maintaining product safety, inventory management, staff safety and adequacy for emergency work, and consumable management. Blood transfusion services also participate in treatment of COVID-19 patients by convalescent plasma (CCP) collection from recovered patients. Blood transfusion services should have a strategic plan to respond to challenges generated during a pandemic which focuses on shortage, wastage, and supply of blood and components in a cost-effective manner. The National Blood Transfusion Council brought out two sets of guidelines incorporating the safety procedures to be taken at the blood centers.

Aims and objectives

This study was done to evaluate the impact of COVID-19 on blood transfusion services in Kerala. We also looked at the various strategies used in various blood centers for ensuring blood safety along with both donor and staff safety.

Materials and Methods

This was an online survey-based study. A questionnaire was framed taking into consideration a recent review article.[6] It looked into the various strategies taken to assure a safe blood supply. The strategies incorporated to handle donor and staff safety and maintaining required resources were also looked into. Google Forms were made and sent across all the blood centers in the state of Kerala on 30th June through WhatsApp and E-mail after collecting the address details from The Kerala State Blood Transfusion Council (KSBTC). We had requested all to respond within a week. The form was closed for responses on 10th of July.

The questionnaire is as per Table 1. It included a few questions on basic details of the blood center, impact on blood center due to lockdown, various strategies used for donor safety, the impact on staff, and impact on availability of consumables and also regarding CCP treatment in COVID-19.

Ethical clearance

The institutional ethical clearance was obtained from Institutional Ethics Committee.

Statistical analysis

The results were entered into Microsoft Excel sheets, and statistical analysis was performed. All the responses were expressed as frequencies and percentages.

Results

Only 52/180 (28%) blood centers responded, 20% each from Trivandrum and Ernakulam. None of the blood centers had to stop their services. The annual blood collection in 2019 in these centers ranged from 400 units to about 30,000 units. 85% had reduction in blood donors (range of 10% to 50%). 97% had reduction in patients (range of 30% to 50%). 99% had a specific COVID screening questionnaire. All the centers followed mandatory wearing of mask and social distancing. 80% had thermal screening and frequent cleaning and sanitization of high-touch surfaces. 35% used disposable bed sheets and implemented a token/prior appointment system. 10% of the centers had conducted outreach blood donation camps. 70% reduction in donor turnout was due to reduced transportation facilities and the rest 30% reduction in donor turnout was due to fear of getting COVID. All centers had educated and trained their staff on COVID-19. 76% had shortage of staff due to lockdown. 90% had a shift system in the form of work arrangement. 35% were not provided PPE as they had shortage. 40% had face shields and 23% had aprons as part of their PPE. 8.15% had some of their staff to undergo quarantine. 57% had a reduction in their salary.

7% blood centers faced shortage in consumables. 23% had an increased wastage in blood components and a few reagents. 99% knew about CCP. 7.5% of the centers were involved in CCP collection. 25% had apheresis facility in their blood center. 99% of the blood centers were willing to be part of CCP collection and preservation if the need arises.

Discussion

Among Indian states, Kerala (population 33.4 million) has the highest human development indices. The high life expectancy rate and the maternal and child health indicators are comparable to those of upper middle-income countries. The literacy rate is also the highest in the country. Kerala is, however, going through an epidemiological transition with a high proportion of noncommunicable diseases presenting a big challenge. The recent outbreaks of NIPAH virus and its successful containment were a big boost for the health sector which has given much importance to public health at the primary level. The challenges lie in enforcing regulations, efficient service delivery, providing access, and ensuring quality of care. These are the commonly reported issues with Kerala's health system. These challenges are most closely mirrored in the blood transfusion services.

As per a recent analysis of blood transfusion services in Kerala done under a WHO initiative,[5] there were 170

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Table 1: Questionnaire

Basic details
Email address
Name of blood bank/blood center
Name of BBMO/head of department
District
Total blood collection in 2019
Impact due to lockdown
Was there reduction in donors during lockdown (April and May)?
Was there reduction in patients during lockdown (April and May)?
If yes, percentage of reduction in donors compared to February
If yes, percentage of reduction in blood issue compared to February
Strategies for donor safety
Thermal screening was used in the center?
Specific questionnaire on travel history?
If social distancing at blood center?
If disposable bed sheets/rolls used?
Was frequent cleaning and disinfection of donor frequented areas?
Was prior appointment/token system to reduce crowding at blood center?
If outdoor blood donation camps were conducted?
What were the barriers faced by donors?
Did any donor later come and tell he is symptomatic?
If yes, what was done with the blood units collected?
Impact on staff
Was there reduction made in number of staff during lockdown?
Was the staff informed and educated about COVID and the precautions to be taken?
Was shift system made mandatory during lockdown?
Was staff provided with PPE?
Was there shortage of PPE for staff?
Which all components of PPE were available for the staff in the donor area?
Was any blood bank staff made to undergo quarantine due to health reasons?
Was there reduction in salary during the lockdown?
Impact on consumables
Did you face shortage in blood bank consumables?
If yes, how was it managed?
Was there increase in wastage of blood/consumables during lockdown?
Convalescent plasma
Have you heard about CCP therapy in COVID?
Was your center used in CCP treatment?
Do you have facility for apheresis equipment in your center?
If yes, is your center willing to be part of CCP treatment?

CCP: Convalescent plasma, PPE: Personal protective equipment, BBMO: Blood bank medical officer

BCs in the state. Four BCs were standalone and run by the IMA, while 166 are located in health facilities involved in delivery of patient care that requires the use of blood and components. Seventy-four BCSUs (44%) have component separation facilities. There are 53 blood storage centers (BSCs) in Kerala of which only 35 are functional. BSCs were not included in the study. BTSs in Kerala are segregated and operate as a sum of multiple actors operating on their own.[5] Kerala has designated 23 regional blood transfusion centers (RBTCs). Of the 23 RBTCs, 18 are hospital based and cater to the captive needs of the hospitals they serve. Kerala has a nodal officer system for each district. This acts as a link to the state nodal officer at the top with all the other blood banks in the district.

Challenges to blood transfusion services due to COVID-19 pandemic

COVID-19 pandemic has affected blood transfusion services right from a decrease in the number of blood donors to an increase in the wastage of blood components. The challenges can be classified as per Table 2.[6]

Only 52 (28%) blood centers of the total 180 as per the KSBTC list across the state responded to the questionnaire. The majority (20% each) were from Trivandrum and Ernakulam, followed by Thrissur and Kollam districts. None of the blood centers had to stop their services due to the COVID outbreak. The annual collection during 2019 in these blood centers ranged from around only 400 units to about 30,000 units. 85% of the blood centers had reduction in blood donors. Reduction in donors ranged from 10% to 50% across various centers depending on the announcement of lockdown and containment strategies from time to time. 97% of the centers had reduction in patients, ranging from 30% to 50%, which could be attributed to the fear among patients, bystanders and donors, of acquiring COVID during visits to the hospitals and blood centers. All of the blood centers started getting more donors toward the end of June 2020.

Almost all centers had made a specific questionnaire regarding travel and symptomatology to screen the donors for COVID. Mandatory wearing of mask and social distancing was also followed universally in all the blood centers. 80% of the blood centers had thermal screening for donors and also had frequent cleaning and sanitization of high touch surfaces. Around 35% of the centers used disposable bed sheets for the donors to lie down while donating. Around 55% of the blood centers had implemented a token/prior appointment system so as to reduce crowd at the blood center. Even though the NBTC guidelines allow the conduct of outdoor blood donation camps after following the central and state health guidelines, only 10% of the centers had conducted outreach blood donation camps during the pandemic.

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Table 2: Challenges to blood transfusion services

Blood donor challenges
(a) Decrease blood donors
Difficulty to reach blood center in lockdown situation
Fear in donors of infection or exposure in hospital or blood center
Lack of blood donation camps
(b) Asymptomatic donors
(c) False history by blood donors
Inventory management challenges
(a) Decrease in demand for blood
OPD shutdown
Routine surgery suspension
(b) Increase in wastage
Shorter life span of near expiry blood components
Fresh blood requirement in specific patients' group
Difficulty in transportation of blood to other blood center
Less transfusion due to fear of transfusion transmissibility
(c) Possibilities of increase of demand at the end of pandemic
Staff challenges
(a) Keep the staff safe from infection
(b) Staff shortage
Possible infected staff
Staff difficulty to reach blood center
Designated staff for blood testing of infected patient
(c) Shortage of PPE for staff
(d) Misuse of PPE by staff
Consumables challenges
(a) Decrease supply
Lockdown of trade
(b) Increase wastage
Expiration of consumables
Follow-up challenges
(1) Donor follow-up
(2) Patient follow-up

OPD: Outpatient department, PPE: Personal protective equipment

The main hindrance faced by the donors in not turning up was due to lockdown restricting their transportation (70%) followed by fear of getting COVID being around 30%. In only two centers, donors had reported fever after donating, of which the components were discarded as they were not transfused. As per the NBTC guideline, such units have to be discarded and if already transfused, the clinician and the other concerned hospital administrators need to be informed.[7]

All the centers had educated their staff regarding the pandemic and had trained them regarding the precautionary measures to be followed. In 76% of the blood centers, there was shortage of staff due to lockdown. In 90% of the blood centers, a shift system in the form of work arrangement with few days off duty was there. 35% of the blood centers responded that they were not provided PPE as they had shortage of it. Centers which had adequate PPE had all of their staff to wear triple-layer mask and latex gloves. 40% had face shields and 23% had aprons as part of their PPE. The PPE to be followed by staff in blood centers as per MOHFW is triple-layer mask and latex gloves only.[8] 15% of the centers had some of their staff to undergo quarantine. 57% of the blood centers had a salary cut even though the central government had issued orders to all states as part of a Supreme Court Judgment on June 18th stating that there should not be any cut or reduction in salary for the health-care workers.

Only 7% of the blood centers faced shortage in consumables due to the lockdown which was handled by sharing with nearby centers and made inhouse. 23% of the blood centers had an increased wastage in blood components and a few reagents due to less use and short expiry. Even though bulk transfer of blood products is allowed by the CDSCO, none of the centers had done it to face the shortage.

Almost all blood centers knew about CCP therapy in COVID-19. Out of which, 7.5% of the centers were involved in CCP collection. In Kerala, the management of COVID is mainly restricted to hospitals in the government sector; hence, all these centers were also in the government sector. Around 25% of the blood centers that had responded had apheresis facility in their blood center. Almost all the centers were willing to be part of CCP collection and preservation if the need arises.

The most common challenges in the order of priority reported in a study conducted by AATM were shortages in blood donors and supply, safety of staff, donors and public, logistics of test kits and consumables, communication and transport, and CCP. AATM study also concluded that shortage of staff was not really a problem but care of safety through prevention of infection (hygiene, PPE, distancing) certainly was a major challenge.[9]

Online platform such as Facebook has come up with blood donor tool for both blood donors and for the blood centers, which would be beneficial in communicating the blood shortages to the willing donors among the public rakthakosh;[10] an initiative by the government of India is also bringing out a freely available bloodstock register which is accessible by anyone, so that the necessary hospitals or donor organizations can do the necessary to maintain an adequate bloodstock. As the country is going into the unlock phase, there is always chance for an increase in transmission of COVID-19 among the population. The blood centers have to do the best possible to ensure safe blood by providing safety to both the donor pool and staffs employees at these centers.

Conclusion

The blood transfusion services are responsible to provide an uninterrupted blood supply, and this stays true even in the face of a pandemic. It requires coordination at every level. The plan of action has to be started at an early stage so that the supply can be maintained and monitored effectively. Health-care workers being one of the main pillars in the fight against COVID-19 have to be supported and protected. The BTS in Kerala responded to the pandemic by strictly following the NBTC guidelines. When the need arises, the infrastructure at various blood centers has to be utilized so that the treatment outcomes of COVID-19 are also improved.

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Conflicts of interest

There are no conflicts of interest.

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