

ORIGINAL ARTICLE

IMPACT OF DONOR INFLOW IN COVID 19 PANDEMIC: A TERTIARY CARE HOSPITALS BLOOD SERVICE EXPERIENCE

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Abstract:

Background: The severe acute respiratory syndrome (SARS) causing the COVID 19 pandemic infection has affected one and all across the world and halting most human activities. During the disease outbreak and country lockdown, Blood Transfusion Services faced numerous challenges to maintain the sustainability in service provision. We intend to identify the challenges faced during COVID-19 outbreak and the following imposed national lockdown. **Methods:** This retrospective study was done during the lockdown period from 26/03/2020 to 30/05/2020 comprising 66 days to detect donor inflow declination and to compare the donor inflow with pre lockdown and post lockdown period of same duration. The periods were divided into six equal intervals to compare donor distribution patterns in lockdown, pre lockdown and post lockdown period. Mean and standard deviation was calculated for continuous variables and chi square test was done for categorical variables. **Results:** The donations collected during the lockdown period and post lockdown period were almost 71.37% and 62.82% less respectively when compared with the pre lockdown collection (211 and 274 versus 737). While in interval periods, donor inflow was declined substantially in lockdown period and in post lockdown period, inflow was declined as of lockdown period initially but it increases as time passed. But the increment was not as such of pre lockdown period. Donor inflow in age group and time interval of donation frequency were statistically significant ($p < 0.00005$ and $p < 0.0037$ respectively). **Conclusion:** Concerns of being infected through hospital contact, lack of public transport facilities, travel restrictions imposed by the police department, and no availability of medical student donors in the hospital setting were the main attributing factors for donor inflow.

Key words: COVID-19 pandemic, Donor inflow, Lockdown, Blood service.

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Introduction:

The novel coronavirus disease in Wuhan, China, in December 2019, has been declared (COVID-19), which began to be a pandemic by the World Health Organization.¹

At the moment, an unprecedented situation is occurring all over the globe – the coronavirus disease

(COVID-19) pandemic. To prevent further spreading of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), governments around the world have urged their citizens to stay at home, limit their social contacts, and keep them to physical distancing. Due to the large health, social, and economic impact of the preventive measures, the pandemic is a ruling topic in (inter)national newspapers, magazines, on

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social media,^[2]television, scientific preprints and articles (with already almost 40,000 hits in PubMed when searching for articles about SARS-CoV-2 or COVID-19), in government communications, and almost all personal and professional communication.³

The novel coronavirus disease 2019 (COVID-19) has triggered a public health emergency of international concern. Within a period of six months, the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) has spread to more than 200 countries/territories, infected more than ten million people worldwide, and claimed over half a million lives. The COVID-19 causes a plethora of clinical manifestations, and the severity and outcomes may vary depending on the underlying comorbidities (diabetes, heart diseases, hypertension, COPD), age, sex, and geographic locations.⁴

From late December'19 till the end of August 2020, in this nine months period, more than 23 million people are affected globally with more than eight hundred thousand death due to COVID-9 pandemic.^[5]Importantly, however, the current COVID-19pandemic poses a risk for individuals wanting to donate blood, as donating is impossible within the bounds of physical distancing. Thus, the costs of donating for individuals are increased in terms of health risks, which may be a barrier for donors. Indeed, several countries had faced drops in their numbers of donors and donations in the early weeks of the pandemic.^[6-8] Individual health

risk might play a particularly salient role for vulnerable groups,^{9,10} such as older donors or donors from regions more affected by COVID-19.

In Bangladesh, from the first case identified on early march this year, 290,360 individuals have tested positive for COVID-19; 172,615 cured and 3,861 died with infection fatality rate of 1.32%, till August 22, 2020.^[11]The capital Dhaka city has a population of nearly 20 million, and currently it is the epicenter of COVID-19 outbreak in Bangladesh. The first three official COVID-19 cases were reported on March 8, 2020. ^[12]The government initially declared a 10-day general holiday started from March 26 which was later extended seven times and expired on May 30 focusing on social distancing measures. Initially strict measures were taken to implement the lockdown, but later it become moderate.¹³

Blood centers are not unaware of the challenges of motivating a blood donor and maintaining blood stocks. This was more felt during the global COVID

pandemic in the situation of lockdowns and social distancing. In a recent article by Choudhury *et al.*, there were major challenges in low- and middle-income countries in terms of shortages in blood donors and supply, safety of staff, donors and public, logistics of test kits and consumables, communication, and transport and convalescent plasma.¹⁴

The purpose of this article is to analyze the declination encountered in the collection of blood from healthy donors during the pandemic situation and comparing them in pre lockdown, lockdown and post lockdown periods.

Methods:

We conducted a retrospective descriptive study in Transfusion Medicine Department of Popular Medical College Hospital (PMCH) on donor inflow during the pre-lockdown, lockdown and post lockdown period. We retrieve information from donor registrations and compiled them in a master data sheet. From this database we extracted donor registrations for the period between lockdown periods(from March 26' 2020 to May 30' 2020 which was 66 days). And we compared data in pre lockdown (20/01/2020 – 25/03/2020) and post lockdown (31/05/2020 – 04/08/2020) periods which comprise 66 days each. We divided the 66 days in equal six intervals of time period to compare donor inflow. We compared the donor registration dynamics in lockdown period with those in the same period in pre lockdown and post lockdown.

Data Analysis:

Descriptive statistics were presented for all registered donors, using means (*M*) and standard deviations (*SD*). To test for differences between groups of donors, we used chi square (χ^2) tests for categorical dependent variables.

Results:

While in the pre lockdown period, the donor flow was as usual and normal where 737 donors were donated blood with mean age 28.70±6.81 years. In the lockdown period, the first nationwide infection prevention measures were imposed by the government (e.g. physical distancing, stay home as much as possible, closing of schools, restaurants, mass transport and sports facilities). In this timeline period 211 donors were available to donate with mean age 31.58±8.18 years. In post lockdown period, while some relaxation of lockdown imposition 274 donors donated blood with whose mean age were 30.25±8.55 years. (Table I)

In figure 1, showed that in the interval period of donor inflow was gradually declined in lockdown period and in post lockdown donor inflow was initially less but it increased as the time being as compared with the lockdown period. Though in these two periods donor inflow were not as desired as that of pre lockdown period.

Age groups were statistically significant in pre lockdown, lockdown and post lockdown periods ($p < 0.00005$). Time interval of donor inflow were also significant in pre lockdown, lockdown and post lockdown periods ($p < 0.0037$).

Table-I
Showing the age group wise distribution of donors.

Pre Lockdown (20/01/2020 – 25/03/2020)				
Age group	Frequency	Percentage	Mean \pm SD	P value
18-24 Years	222	30.12	28.70 \pm 6.81	0.00005
25-31 Years	298	40.43		
32-38 Years	151	20.49		
39-45 Years	54	07.33		
46-52 Years	11	01.49		
53-59 Years	01	00.14		
Total	737	100.00		

Lockdown (26/03/2020 – 30/05/2020)			
Age group	Frequency	Percentage	Mean \pm SD
18-24 Years	44	20.85	31.58 \pm 8.18
25-31 Years	69	32.70	
32-38 Years	59	27.96	
39-45 Years	28	13.27	
46-52 Years	07	03.32	
53-59 Years	04	01.90	
Total	211	100.00	

Post Lockdown (31/05/2020 – 04/08/2020)			
Age group	Frequency	Percentage	Mean \pm SD
18-24 Years	83	30.29	30.25 \pm 8.55
25-31 Years	87	31.75	
32-38 Years	58	21.17	
39-45 Years	28	10.22	
46-52 Years	15	05.48	
53-59 Years	03	01.09	
Total	274	100.00	

Table-II
Showing frequency intervals of donor inflow

Intervals	Pre lockdown		Lockdown		Post lockdown	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1 st interval	122	16.55	51	24.17	35	12.77
2 nd interval	131	17.78	45	21.33	37	13.50
3 rd interval	116	14.11	37	17.53	44	16.06
4 th interval	123	17.37	30	14.22	48	17.52
5 th interval	126	18.45	25	11.85	59	21.53
6 th interval	119	15.74	23	10.90	51	18.62
Total	737	100.00	211	100.00	274	100.00

Chi square value= 25.9812, df= 10, p value= 0.003766

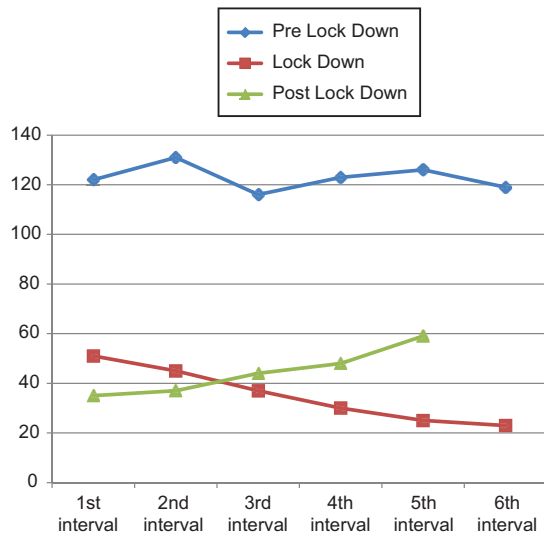


Fig-1: Showing frequency interval of donor inflow.

Discussion:

This present study was done to analyze the donor reduction process in the global impact of COVID-19 situation. Reduction of donor numbers before, during and after a COVID-19 outbreak is a major risk for blood services. The epidemic has the potential to reduce the supply of blood and blood components and adversely affect blood system activities. But experience with outbreaks of other coronaviruses suggests that there will be significant impact on blood supplies through reduced blood donation.¹⁵⁻¹⁷ These studies were in line with the present study.

In all responding countries,¹² the Ministry of Health is actively supporting the blood establishments in the motivation of potential donors to overcome resistance and prejudices, mobilization and transport

of potential blood donors. Several countries reported observed reasons for reduced blood collections both actively and passively. Bhutan noticed fear for infections; Albania reported problems in communication with potential donors, but also like Bangladesh a reduction in the daily routine surgical interventions. However, ministerial messages urging people to stay home and observe the lockdown also has resulted in confusion and the interpretation that one should not go out for blood donation.^[12] The reduced donor number found in lockdown and post lockdown period in this study may be the causes shown in the above study.

In our study the collection of blood were 737 in pre lockdown period, which felled to 211 and 274 donors in lockdown and post lockdown period respectively. The present pandemic has taken a toll on all blood banks who are reporting dwindling supplies of this scarce human resource. During this ongoing pandemic, similar experience has been reported by blood services in China^[18] and Iran.^[7] Earlier studies with similar disease outbreaks have also reported a reduction in blood supplies during emergencies.^[19] This is largely attributed to a lack of awareness in the general public, resulting in fear of acquiring the infection by visiting the blood bank or during the process of donation. Above studies and present study findings conforms each other.

In general younger peoples are coming forward for blood donation in usual and emergency situations. In our study showed that teenagers (i.e. 18-31 years) 70.55% were in pre lockdown period which reduced to 53.55% in lockdown and 61.99% in post lockdown period. Waheed U et al.²⁰ in their study regarding transfusion needs of thalassemia patients in pandemic situation, the donations collected during

the month of March were almost 50% less when compared with the average collection (298 blood units versus an average collection of 624). The university and college students are the most dependable and frequently tapped donors in any disaster situation followed by formal appeals at the religious gatherings in mosques. However, closure of educational institutions and banning of social mixing lead to shortage of blood. This may be the cause of younger donors reduced collection of blood during the pandemic circumstances in the present study.

Conclusion:

COVID-19 is a devastating and emergent disease that affected each and every corner of the globe. Effects of pandemic on blood donors and blood supply, where most countries already were suffering from shortages due to their development state. Blood donation is inherently an altruistic motive and they volunteer to donate. The COVID-19 pandemic, a public health crisis with enormous societal impact particularly risk of getting infection, closure of educational institute and communication problem. So, the outcome of study needs to be further evaluated by larger sample with multicenter study.

Limitations:

This study is a hospital based study and sample size was not large. So, it may not represent the exact picture of the whole country.

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Declaration of interest:

The authors report no conflict of interest.

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Ethical consideration:

The study was conducted after approval from the ethical review committee. The confidentiality and anonymity of the study participants were maintained.

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