# Significant decrease in the transfusion rates during the COVID-19 pandemic in the North East of Iran

Dear Editor,

The worldwide pandemic of the coronavirus disease 2019 (COVID-19) significantly influenced healthcare systems and disrupted daily lives. According to WHO's official report, among Asian countries with the coronavirus, Iran has the highest number of coronavirus deaths, followed by India [1]. The Iranian Blood Transfusion Organization (IBTO) experienced a significant reduction in blood donations and a subsequent shortage in blood stores which made hospitals decide to postpone elective surgeries [2].

The study of the transfusion practices in this particular condition can affect the policies and planning with respect to transfusion management during other similar public health emergencies in the future. In this respect, so far, some studies have been conducted on the pattern of blood product consumption during the COVID-19 pandemic in different regions of the world. Studies conducted in Washington, Chicago, Maryland, Spain, China and Singapore reported a decrease in blood product transfusion, ranged between 17.7% to 66.5% [3–7]. Similarly, a survey that assessed the transfusion demand in the Eastern Mediterranean Region (EMR) reported that most centers experienced a reduction of 10% to 50% and those who did not have active hematology-oncology departments [8].

However, it is expected that these patterns of demand will differ considerably according to different healthcare tactics and management strategies.

During the studied COVID-19 time frame (from 21 February 2020 to 22 September 2020), a total of 20,749 blood components were transfused to 13,840 patients (non-COVID and COVID). The transfused units were decreased by about 31% in the COVID-19 period compared to the corresponding time frame before the COVID-19 pandemic. Regarding the postponement of elective surgeries and decrease in the admission of non-urgent patients, a considerable decline would be expected.

The largest decrease among transfused blood components was seen in red blood cells (RBCs) with a 47.3% decrease. In the next place is cryoprecipitate (cryo) with 34.1%, followed by platelets (PLTs) with 18.9%. The lowest reduction was observed in fresh frozen plasma (FFP) units with 18.4%.

**Table 1**

Transfusion rate[a] (unit × 100/patient-day) of COVID-19 patients compared to non-COVID-19 patients during study timelines.

| Blood components | Non-COVID-19 patients[b] transfusion rate (mean ± SD[c]) | COVID-19 patients transfusion rate (mean ± SD[c]) | P-value[d] |
|---|---|---|---|
| Total | 19.2 ± 1.0 | 9.9 ± 4.1 | < 0.001 |
| RBCs | 6.8 ± 0.5 | 2.15 ± 0.8 | 0.003 |
| PLTs | 5.9 ± 0.7 | 3 ± 0.8 | 0.04 |
| FFP | 4.8 ± 0.7 | 3.7 ± 3 | 0.5 |
| Cryo | 1.7 ± 0.3 | 0.8 ± 0.4 | 0.05 |

[a] Transfusion rates were defined as the number of transfusion events in a month divided by the number of patient-days in that particular month.

[b] Non-COVID patients for the preceding 12 months before the COVID pandemic.

[c] After calculation of the transfusion rate in each month, the mean ± SD was calculated during the studied time frames.

[d] Transfusion rates were compared by the Mann–Whitney *U* test.

Comparing the transfusion rate for study timeframes, the total transfusion rates, as well as the transfusion rate of each blood component in COVID-19 patients, were significantly lower compared to non-COVID patients, except for FFP. The transfusion rate of FFP was also lower in COVID-19 patients but did not reach a statistical significance level (Table 1, Fig. 1).

There is an intriguing point about the use of platelet and plasma products in different studies. The reduction in platelet consumption varies from 38.7% to 12.1%, while some studies have reported an increase of 10% [4–9]. There could be several explanations for these differences. In our center, due to the active hematology-oncology department, our PLTs demand remained stable. Furthermore, FFP and PLTs are frequently requested for the management of COVID-19-associated coagulopathy and thrombocytopenia that are commonly presented in critically ill patients.

Most of these critically ill patients also need invasive mechanical ventilation and require intensive care unit hospitalization. Patients with severe COVID-19 are supported with extracorporeal membrane oxygenation (ECMO), and performing such a procedure on patients is known to increase the administration of blood products considerably [10].
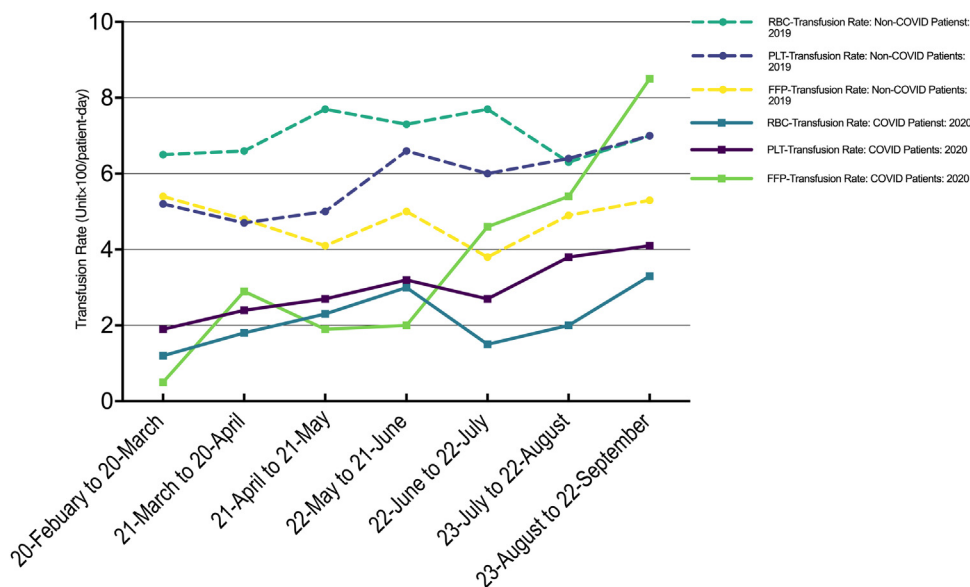


**Fig. 1.** Comparative transfusion rates of each blood component from February 20 to September 22, 2019 and 2020.

Interestingly, the transfusion rate of non-COVID patients who had been admitted during the pandemic was significantly higher than the rates of patients before the pandemic for RBCs (9.7 vs. 6.8 units/patient-day; $P = 0.01$), for PLTs (13 vs. 5.9; $P < 0.001$), for FFP (8.75 vs. 4.8; $P = 0.01$), and for cryo (2.6 vs. 1.7; $P = 0.3$). A possible explanation for these findings is given the condition caused by the quarantine and social restrictions, there was an overwhelming fear among patients to visit hospitals. This delay in referral may cause the disease to deteriorate and increase the need for blood transfusion. Furthermore, given the prevailing condition in the hospital, the increase in the number of COVID-19 patients, a reduced hospitalization capacity, and also an impaired operating room availability and efficiency physicians adopt more conservative strategies to sustain life and improve patients' outcomes, including blood transfusion.

In summary, during the first and second waves of the COVID-19 outbreak in Iran, the overall transfusion of blood components decreased. However, from an organizational standpoint, we faced additional challenges as we attempted to address both COVID-19 and concurrent transfusion needs of non-COVID wards. This emphasizes the need for more targeted measures and interventions by precisely following recommended clinical guidelines on blood transfusion.

### Ethical statement

The study protocol was reviewed and approved by the ethics committee of the Mashhad University of Medical Sciences (IR.MUMS.MED.REC.1399.713).

### Funding

### Contributions

Samaneh Boroumand–Noughabi: project administration, supervision, writing – review & editing; Atefe Rahmati: investigation, data curation, writing – original draft preparation; Negar Morovatdar: conceptualization, methodology, software, formal analysis; Mohammadreza Keramati: writing – review & editing.

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### Disclosure of interest

The authors declare that they have no competing interest.

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## Seroprevalence of SARS-CoV-2 among blood donors: A practical serosurveillance tool for COVID-19

Dear Sir,

We read with great interest the publication titled "SARS COV-2-IgG antibodies in blood donors in pandemic - a game changer for policy makers" by Mahapatra [1]. In the study the author has concluded that seroprevalence of SARS-CoV-2 IgG antibodies among blood donors can be used as a surveillance tool to estimate the extent of spread of SARS-CoV-2 among the general population. We would like to share ideas related to this publication. The antibody tests against SARS-CoV-2 can be broadly classified into two types:

- immunochromatography based lateral flow assays;

- ELISA (enzyme linked immunosorbent assay)/chemiluminescence based assays.

Herein, the aspects related to use of antibody tests among blood donors for serosurveillance of SARS-CoV-2 infection are discussed.

### 1. Rapid card test vs. ELISA, which test to use for screening as an epidemiological tool for serosurveillance?

A screening test for serosurveillance should have the following features:

- should be easy to conduct;
- should be reasonable in cost;
- should be widely available for mass screening;