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Letter to the Editor



Transfusion of blood products derived from SARS-CoV-2+ donors to patients with hematological malignancies

Patients with hematological malignancies (HMP) represent a vulnerable population and need special protection. They are frequently immunosuppressed and infections in HMP can have deleterious consequences. In addition, these patients need frequent transfusions, especially of platelet concentrates.

The COVID-19 epidemic poses an additional problem for HMP, who face high mortality rates if infected by SARS-CoV-2 [1]; in fact blood donors can show sign of the disease following donations. While plasma and red blood cells can be safely used later than 14 days, which represents the maximum time needed for symptoms development, some blood derivatives (platelet concentrates) must be used shortly after donation (usually within 5 days).

We describe here 7 cases of HMP receiving blood derivatives, especially platelet concentrates, from donors who developed symptoms after blood donation and tested positive to SARS-CoV-2 in all but one case (Table 1). Transfusions were performed in an inpatient setting in 4 out of 7 cases. Baseline diagnoses included acute myeloid leukemia (3 cases), myelodysplasia (2 cases), acute lymphoblastic leukemia (1 case), chronic myeloproliferative disease (1 case).

The time elapsed from donation to the onset of symptoms ranged between 2 and 10 days (median 7 days). In two cases the donor was not tested after symptoms development as the national guidelines of the Italian “Centro Nazionale Sangue” do not require it (http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministero&id=4107).

The presence of SARS-CoV-2 RNA was assessed by a PCR based method on nasopharyngeal swabs. The presence of serum antibodies against SARS-CoV-2 (IgG and IgM anti-s1 and anti-s2) was detected by an ELISA based method.

The transfusions did not result in the infection of the HMP with SARS-CoV-2 as determined by nasopharyngeal swabs performed up to 14 days post transfusion, with a single exception of a patient (#7) who developed SARS-CoV-2 positivity 2 days after transfusion, concomitantly with cerebral artery thrombosis that developed in spite of the patient being thrombocytopenic. Unfortunately, the donor in this case was tested for COVID-19 only 1 month after developing COVID-like symptoms. The result was negative; a serological test (against SARS-CoV-2 nucleoprotein) was performed 2 months later and showed a negative result. Therefore, although SARS-CoV-2 infection in this donor was unlikely, the suboptimal timing of testing and the fact that infected individuals can show no sign of serological conversion do not allow to rule out an undiagnosed infection in this case. However the possibility

that the patient acquired a community transmitted infection is also possible since the transfusion was performed in an outpatient setting.

A similar report from South Korea failed to identify SARS-CoV-2 infection in 6 patients (not all HMP), who received transfusions in a situation similar to our series [2].

The risk that a transfusion from a SARS-CoV-2+ donor can transmit the disease to the recipient is currently unknown. A recent report identified SARS-CoV-2 RNA, but no intact infectious virus in 3 plasma samples from French donors; however in 2 out of 3 cases blood products were not transfused and therefore the risk of transfusion could not be evaluated [3]. Another article [4] reports that no trace of the virus was found in the serum of COVID-19+ patients; however, this study did not analyze circulating blood cells, such as endothelial cells and monocytes that are suspected to be a target of the virus and effectors, through sFlt-1 production, of the marked thrombophilia that develops in many patients [5].

Furthermore, the same article [4] reports that the nasopharyngeal viral load of these symptomatic patients showed only a descending phase, thus highlighting how the ascending phase and the peak of positivity probably occurred before the development of symptoms and was therefore lost in already symptomatic patients. Therefore, the viremic phase which characterizes any viral infection could have occurred prior to the observation time in this published study. The asymptomatic phase of SARS-CoV-2 infection could thus represent the critical phase for the safety of blood transfusions. It is worth mentioning that a recent publication documented the presence of viral particles inside endothelial cells obtained from advanced cases of COVID-19 [6] and that increased number of circulating endothelial cells were identified in COVID-19 patients [7].

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Declaration of Competing Interest

The authors report no declarations of interest.

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Table 1

Description of the seven cases of transfusions in HMP patients. The presence of SARS-CoV-2 RNA was assessed by a PCR based method on nasopharyngeal swabs.

Case #	Date of donation (2020)	Date of symptom development	Date COVID-19 diagnosis	Type of transfusion	Date of transfusion and setting (in/outpatient)	Date and result of COVID-19 test on recipient (2020)
1	March 23th	March 26th, fever, ageusia, anosmia March 10th	April 7th	Platelets	March 24th inpatient	April 8th, negative
2	March 8th	Fever, cough	March 15th	Platelets	outpatient	March 16th Negative April 3rd Negative
3	March 5th	March 12th Fever and myalgia	March 15th	platelets	inpatient	March 16th, negative March 23rd, negative March 30th negative
4	March 3rd	March 10th Fever sore throat, myalgia	Test not performed	Platelets	outpatient	March 8th Negative April 6 Negative
5	February 24th	February 28th; flu-like syndrome Fever	March 8th	Platelets	February 28th inpatient	March 7th Negative Died on March 18th (DIC; sepsis: urinary tract infection by enterococcus faecalis in cachexia)
6	March 11th	Asymptomatic	March 21st	Red Blood Cells	March 17th inpatient	March 29th, negative April 7th, Negative
7	March 16th	March 26th flu-like syndrome Fever	Test performed after acute phase (see text)	Red Blood Cells	March 27th outpatient	March 30th Positive

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