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LETTER TO THE EDITOR

# Lack of transmission of SARS-CoV-2 by platelet transfusion from a COVID-19-positive donor in a hematopoietic stem cell transplantation patient

To the Editor:

The corona virus disease 2019 (COVID-19) is caused by an enveloped, single-stranded positive-sense RNA virus, severe acute respiratory coronavirus 2 (SARS-CoV-2).[1] The pathogenesis, variability of symptoms, and mode of transmission are poorly understood. However, the confirmed mode of transmission is by respiratory droplets.[2,3] The detection of SARS-CoV-2 RNA has been reported in blood from infected patients.[4] No reports have confirmed the possibility of viral transmission via blood products or feco-oral route despite detection of the virus in blood and stool.[2,3]

We report a 22-month-old boy diagnosed with acute pre-B lymphoblastic leukemia (ALL) who underwent matched related donor hematopoietic stem cell transplant (HSCT) for persistent disease. The neutrophils and platelets (PLT) were engrafted on day + 12 and day + 18 posttransplantation, respectively. On day + 22, he developed high-grade fever with no respiratory symptoms or other apparent focus. Laboratory evaluation showed thrombocytopenia, transaminitis (more than five-fold above normal range), and mild elevation of total bilirubin level. His serum LDH was 744 U/L, and cytomegalovirus blood polymerase chain reaction (PCR) showed a low copy number (35 copies/mL). Abdomen/liver Doppler ultrasound showed right portal vein reversal of flow and gall bladder thickening suggesting veno-occlusive disease (VOD). He required PLT and red blood cell transfusions. His aPTT, PT, lactate, and peripheral blood smear were unremarkable. PLT transfusion continued in the following 4-5 days for a total of six different single donor apheresis PLT units. The patient's high-grade fever episodes occurred for 1 day after his first PLT transfusion. Later, the platelet unit was flagged as donated from COVID-19-positive donor, whose nasal swab was positive for SARS-CoV-2, 5 days after donation. None of the other PLT donors were suspected as per transfusion service screening policy to have COVID-19. The patient was kept on broad-spectrum antibiotics, diuretics, low-dose steroids, and defibrotide therapy. All his blood cultures came back negative and his liver enzymes gradually normalized. Given the current COVID-19 pandemic and the exposure risk to the positive-donor PLT, we performed nucleic acid amplification testing (NAAT) with a reverse transcription-polymerase chain reaction (RT-PCR) assay from both nasopharyngeal swab and blood. Results showed no laboratory evidence of acquiring coronavirus (Figure 1). We confirmed the negative results with second samples from both blood and nasopharyngeal swab on day 14 following PLT transfusion.

Pediatric HSCT during epidemics has been performed with precautions, such as collection and cryopreservation of stem cells prior to conditioning regimen initiation.[5] All patients who receive myeloablative regimens need frequent blood product transfusions. During the COVID-19 pandemic, there are challenges in the availability of donors due to curfew laws in different countries and the safety of donation. The American Association of Blood Banks has issued a statement to support donation during the pandemic period and did not report any case of viral transmission through blood product donation.[6] Donor eligibility includes the absence of symptoms or exposure for the previous 28 days. If tested positive, the donor could donate after 14 days from negative repeated nasal swab testing, or after being asymptomatic for at least 28 days if the test is not repeated. Other preventive measures include avoidance of overcrowding in centers, obligatory face masking at all times, one direction flow process, and area sterilization with every donation.[6] Despite these preventive measures, this approach could lead to missing asymptomatic infected donors at the time of donation, similar to what happened in our case.

Universal SARS-CoV-2 blood PCR testing for donors is not widely available compared to available nasal swabs/aspirates. Many centers use NAAT and RT-PCR assay for screening. Although the performance of NAAT in SARS-CoV-2 has not been thoroughly evaluated, it is considered a highly specific test.[7] The sensitivity of testing depends on many factors, including the duration of illness and exposure as well as the type and quality of the specimen obtained.[4]

Pathogen-inactivating treatment, which involves photochemical treatment of blood products, could be done. This might be challenging due to platelets' short half-life, unavailability of agents, biochemical changes, lack of enough evidence of efficiency against emerging pathogens, and the additional costs.[8,9]

In pediatric immunosuppressed patients, current reports suggest milder COVID-19 disease compared to adults, especially in developing cytokine release syndrome and thrombotic events.[11,12] This patient had other features of hyperimmune response, including fever and VOD (platelet refractoriness and high liver enzymes with imaging findings) and negative bacterial cultures. The patient had received defibrotide, low-dose steroids, cyclosporine, and broad-spectrum antibiotics. Despite repeated negative SARS-CoV-2 testing, many reports suggest that the above suppressants may contribute to COVID-19 complications. It is unlikely that our case is related to COVID-19 and could be seen in other HSCT patients with VOD.

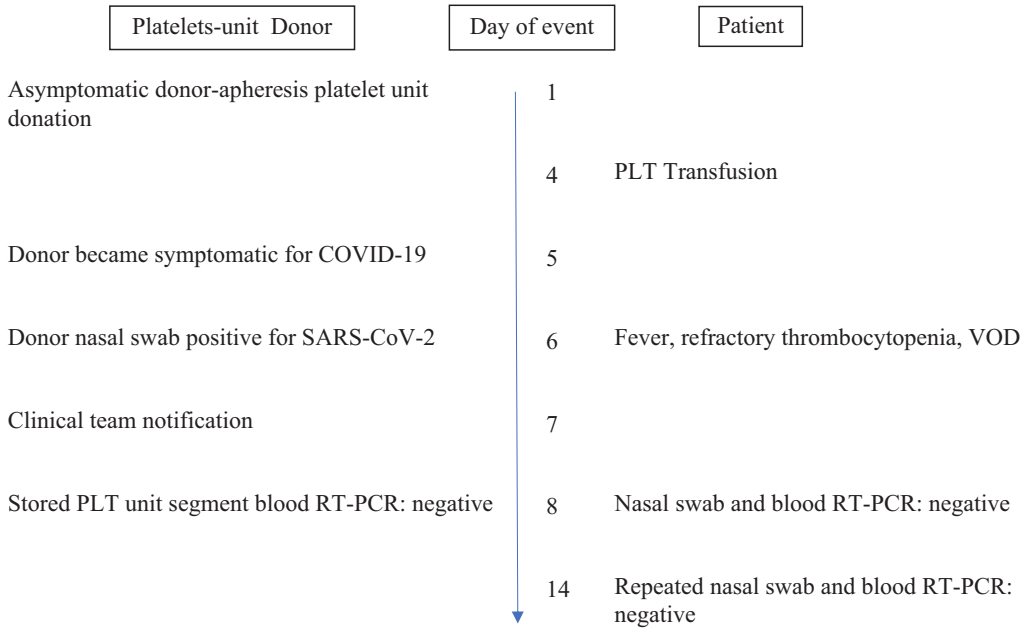


**FIGURE 1** Sequence of events in patient after receiving platelets from SARS-CoV-2-positive donor. PLT, platelets; RT-PCR, reverse transcription-polymerase chain reaction; SARS-CoV-2, severe acute respiratory coronavirus 2; VOD, veno-occlusive disease

The potential risk of acquiring the disease through contact with asymptomatic patients is possible.[13] The repeated negative tests in our patient for the following 14 days suggest a low probability of transmission through blood products, even though the donor was tested positive from nasal swab similar to another reported patient with severe aplastic anemia who received blood products transfusion.[14]

In summary, this report supports the current available evidence that SARS-CoV-2 transmission through blood products is unlikely. However, given the possibility of encountering severe disease and significant mortality and morbidity rates around the world, objective donor-screening methods and universal deactivating techniques are warranted to decrease the risk of viral transmission especially in pandemic situations.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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