Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Journal of Infection and Public Health 13 (2020) 1678–1679

Contents lists available at ScienceDirect

Journal of Infection and Public Health

journal homepage: http://www.elsevier.com/locate/jiph

Short Communication

COVID-19 transmission and blood transfusion: A case report

Hee Jeong Cho[a,b], Ji Wan Koo[a], Soong Ki Roh[c], Yu Kyung Kim[c], Jang Soo Suh[c], Joon Ho Moon[a,b], Sang Kyun Sohn[a,b], Dong Won Baek[a,b,*]

[a] Department of Internal Medicine, Kyungpook National University Hospital, School of Medicine, Kyungpook National University, Daegu, Republic of Korea
[b] Department of Hematology/Oncology, Kyungpook National University Hospital, School of Medicine, Kyungpook National University, Daegu, Republic of Korea
[c] Department of Laboratory Medicine, Kyungpook National University Hospital, School of Medicine, Kyungpook National University, Daegu, Republic of Korea

ARTICLE INFO

Article history:
Received 6 April 2020
Received in revised form 30 April 2020
Accepted 3 May 2020

Keywords:
Blood transfusion
Coronavirus
COVID-19
Viremia
Transmission

ABSTRACT

The recent outbreak of the novel coronavirus disease 2019 (COVID-19) has been labelled as a pandemic by the World Health Organization. Although person-to-person transmission of the etiologic agent, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has been confirmed, it is not known whether COVID-19 may be transmitted by blood transfusion. Notwithstanding the urgent requirement of blood, it is critical to know whether the SARS-CoV-2 virus can be transmitted by blood transfusion because many individuals may be asymptomatic carriers and may donate blood. Several cases in which specific viral RNA could be detected in the serum from patients with COVID-19 have already been reported; these findings suggest that blood donation may be an unexplored route of transmission. However, the American Association of Blood Banks and Centers for Disease Control and Prevention have not recommended any specific SARS-CoV-2-related actions to be taken at blood collection centres at this time. In this report, we describe a case of a 21-year-old man with very severe aplastic anaemia who received apheresis platelet transfusion from an individual who was subsequently diagnosed with COVID-19. Our patient tested negative for COVID-19 and is awaiting allogeneic stem cell transplantation.

© 2020 The Author(s). Published by Elsevier Ltd on behalf of King Saud Bin Abdulaziz University for Health Sciences. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

Beginning in late December 2019, there were numerous cases emerging from Wuhan, Hubei Province, China, of a new type of severe pneumonia of unknown etiology [1,2]. The etiologic pathogen has since been identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2); this virus has since spread rapidly to many countries throughout the world [3]. The SARS-CoV-2 outbreak has currently been labelled as a pandemic by the World Health Organization.

Person-to-person transmission of SARS-CoV-2 has already been confirmed [4]. Contact with respiratory secretions from virus-infected individuals is currently known to be the main route of transmission, although there are reports of virus transmission via aerosol droplets and physical contact [5]. However, it is not known whether the novel coronavirus disease 2019 (COVID-19) can also be transmitted by blood transfusion. Patients with haematologic diseases such as aplastic anaemia may require frequent blood transfusions; as such, it is critical to ensure that all donations are from clearly healthy people as few people are ready to donate blood currently. Notwithstanding the urgent requirement of blood, it is critical to know whether the SARS-CoV-2 virus can be transmitted by blood transfusion because many individuals may be asymptomatic carriers and may donate blood. Although SARS-CoV-2 RNA has been detected in serum or plasma from infected patients, there are no data or cases suggesting the risk of transmission of SARS-CoV-2 via blood transfusion [6].

Here, we report the case of a 21-year-old man with severe aplastic anaemia who received platelet transfusion from an individual who was infected with SARS-CoV-2.

Case

A 21-year-old Korean male was diagnosed with very severe aplastic anaemia in November 2019. His bone marrow was pancytopenic at presentation (10% of normal); his condition did

* Corresponding author at: Department of Hematology/Oncology, Kyungpook National University Hospital, School of Medicine, Kyungpook National University, 130 Dongdeok-ro, Jung-gu, Daegu, 41944, Republic of Korea.
E-mail address: baekdw83@gmail.com (D.W. Baek).

https://doi.org/10.1016/j.jiph.2020.05.001
1876-0341/© 2020 The Author(s). Published by Elsevier Ltd on behalf of King Saud Bin Abdulaziz University for Health Sciences. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

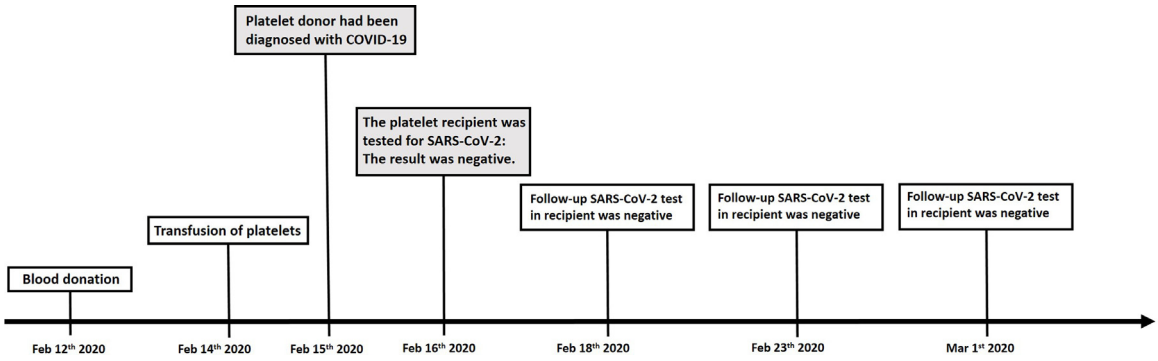

Fig. 1. Timeline of the platelet donor and recipient.

not improve in response to immunosuppressive therapy with anti-thymocyte globulin and cyclosporin. He underwent multiple transfusions in preparation for an allogeneic haematopoietic stem cell transplantation. In February 2020, he presented at an outpatient clinic with petechiae and epistaxis. He was admitted to the haematology department for platelet transfusion and supportive care. At the time of admission, his vital signs were stable and he had no fever; his general condition was good, and he presented with no evidence of infection and was classified as having an Eastern Cooperative Oncology Group performance status of 1. His initial complete blood count included a WBC count of 270/mm^3 (absolute neutrophil count, 30/mm^3), Hb of 8.1 g/dl and a platelet count of 7,000/mm^3. Immediately upon admission, he was transfused with apheresis platelets from a presumably healthy donor.

One day after the platelet transfusion, the blood bank notified our department that the platelet donor had been subsequently diagnosed with COVID-19. The blood products were collected 2 days before the platelet transfusion took place; the donor was perceived to be healthy and had no fever or respiratory symptoms at that time. The platelet recipient was tested for SARS-CoV-2 using real-time reverse transcription (RT)-PCR; the result was negative. The patient did not show any symptoms of infection, and there was no evidence of pneumonia on chest computed tomography. Three more tests for SARS-CoV-2 were performed; all of the results were negative (Fig. 1). The patient has remained stable and is now being prepared for the scheduled allogeneic haematopoietic stem cell transplantation.

Discussion

COVID-19 can be transmitted from asymptomatic individuals; this feature may play a critical role in this pandemic status [7]. Furthermore, the mean incubation period for SARS-CoV-2 infection has been reported to be from 0 to 14 days. In this case, transfusion of blood products obtained from infected individuals who had not yet developed signs and symptoms of COVID-19 did not result in disease transmission, even though, the platelet recipient was diagnosed with very severe aplastic anaemia and was taking immunosuppressive drugs.

Interestingly, there are existing pathogen inactivation technologies that might minimise the risk of transmission of SARS-CoV-2 via blood transfusion; coronaviruses are highly susceptible to heat inactivation and/or denaturation at acidic or basic pH [8], although there is concern that these methodologies might damage blood components. The American Association of Blood Banks (AABB) and Centers for Disease Control and Prevention (CDC) currently do not recommend any specific SARS-CoV-2-related actions by blood collection establishments [6]. Meanwhile, the European Center for Disease Prevention and Control (ECDC) suggests a precautionary deferral from donation of blood for 21 days after any possible exposure to confirmed patients [9]. Additionally, those recovering from COVID-19 should avoid donating blood for at least 28 days after symptom resolution and completion of therapy [9].

SARS-CoV-2 infection can result in a spectrum of diseases, from mild respiratory symptoms to severe, life-threatening pneumonia. Therefore, it is critical to consider the potential for transmission of this infection by blood transfusion.

Funding

No funding sources.

Competing interests

None declared.

Ethical approval

Not required.

References

[1] Zhu N, Zhang D, Wang W, Li X, Yang B, Song J, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727–33.
[2] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. N Engl J Med 2020;382:1199–207.
[3] Drosten C, Gunther S, Preiser W, van der Werf S, Brodt HR, Becker S, et al. Identification of a novel coronavirus in patients with severe acute respiratory syndrome. N Engl J Med 2020;348:1967–76.
[4] Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. Lancet 2020;395:514–23.
[5] Jin YH, Cai L, Cheng ZS, Cheng H, Deng T, Fan YP, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). Mil Med Res 2020;7:4.
[6] Update: impact of 2019 novel coronavirus and blood safety. American Association of Blood Banks; 2020. Available at: http://www.aabb.org/advocacy/regulatorygovernment/Documents/Impact-of-2019-Novel-Coronavirus-on-Blood-Donation.pdf. [Accessed on 31 March 2020].
[7] Wu D, Wu T, Liu Q, Yang Z. The SARS-CoV-2 outbreak: what we know. Int J Infect Dis 2020;94:44–8, http://dx.doi.org/10.1016/j.ijid.2020.03.004 [Epub ahead of print].
[8] Chang L, Yan Y, Wang L. Coronavirus disease 2019: coronaviruses and blood safety. Transfusion Med Rev 2020, http://dx.doi.org/10.1016/j.tmrv.2020.02.003 [Epub ahead of print].
[9] Outbreak of acute respiratory syndrome associated with a novel coronavirus, Wuhan, China; first update. Control ECfDPa; 2020. Available at: https://www.ecdc.europa.eu/sites/default/files/documents/Risk-assessment-pneumonia-Wuhan-China-22-Jan-2020.pdf. [Accessed on 31 March 2020].