

COVID-19 Pandemisinde Kan Güvenliğinin Geleceği: Olgu Sunumu ve Literatürün Gözden Geçirilmesi

The Future of Blood Safety During COVID-19 Pandemic: A Case Presentation and Review of Literature

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ÖZ

Yeni koronavirüs (COVID-19) tüm dünyada global bir sağlık krizi olarak yayılmaya devam etmektedir. Kişilerarası temasta solunum sistemi sorumlu tutulsa da sıra dışı bulgularla seyreden COVID-19 hastaları nedeniyle virüs hakkındaki bilinmezler giderek artmaktadır. Virüsün kan yolu ile bulaşım bulaşmadığı halen kesin olarak bilinmemekte, bu durum kan bankalarının geleceği konusunda tartışmalara yol açmaktadır. Bu raporda asemptomatik COVID-19 hastası bir donörden alınan kanın transfüze edildiği bir kritik yoğun bakım hastanın sunulması ve pandemi sürecinde kan güvenliği konusundaki literatürlerin gözden geçirilmesi amaçlanmıştır.

Anahtar Kelimeler: kan transfüzyonu, kan güvenliği, koronavirüs enfeksiyonu

ABSTRACT

The novel coronavirus (COVID-19) continues to be a global health crisis all around the world. Although the respiratory system plays a major role in the person-to-person transmission, unknowns about this virus gradually increase due to Covid-19 patients represented with unusual symptoms. It's still not known exactly whether or not it is a blood-borne pathogen, so, this brings along the discussions about blood safety in the future. In this report, it's aimed to represent a case received a blood transfusion from an asymptomatic COVID-19 donor and review the literature about blood safety during pandemic.

Keywords: blood transfusion, blood safety, coronavirus infections

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INTRODUCTION

As the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) novel coronavirus (named COVID-19 disease) continues to spread across the world, healthcare is faced with new serious medical topics. One of the main issues is the future of blood banks due to decreasing blood donation and blood reserves for urgent needs. Due to the pandemic, the number of volunteer blood donors is dropping resulting in blood shortages. The Pan American Health Organization announced that the need for blood reached to clinical level and the volunteers must be continued to donate blood (1). Also, a serious decline has been reported in blood storage with the beginning of the pandemic in our country; however, it tends to be fine by the national blood donation campaign conducted by government and non-governmental organizations.

If we look from the opposite perspective, the characteristics of this virus include many scientific uncertainties and there is some confusion about it's a blood-borne pathogen or not. This means that transfusion safety during the pandemic is worthy of consideration due to the increased asymptomatic infectious cases. Previous studies indicated that the viral RNA of SARS CoV-2 has been detected in the blood, plasma, or serum of the infected patients (2-4). So, the RNA detection in the banked blood is not to be surprising (5,6). Experiments indicated that an average of 10-15% of critically ill patients represented SARS-CoV-2 RNA in their blood samples (7). The U.S. Food and Drug Administration declared that "The potential for transmission of SARS-CoV-2 by blood and blood components is unknown at this time and they have been no reported cases of transfusion-transmitted coronavirus". However, the transfusion-transmitted infection risk with SARS-CoV-2 is theoretically possible but not be completely excluded (8).

In this report, we aim to represent a case that received a blood transfusion from the asymptomatic Covid-19 blood donor and review the literature about blood safety during the pandemic.

CASE REPORT

A 55-year-old male patient was presented to the emergency room with a complaint of the passage of black, sticky, and malodorous stool. The history revealed controlled hypertension, diabetes mellitus, and chronic epigastric burning which had been a problem of many years. No previous bleeding tendency was indicated. On physical examination, he had weak peripheral pulses with a heart rate (HR) of 120/min. Non-invasive blood pressure (BP) was 100/ 70 mmHg and the patient complained of dizziness upon standing and lightheadedness. He was alert but unable to answer appropriately. There was facial pallor, cool, and moist skin. A rectal examination revealed melena. The initial hemoglobin (Hb) level was 10.5 g/dL. The patient was managed conservatively with fluid resuscitation and close monitoring. An emergency esophagogastroduodenoscopy was scheduled but before the procedure, the patient suddenly became hypotensive (blood pressure (BP) of 60/40 mmHg), confused, and developed respiratory insufficiency with a respiratory rate of 40/min. The heart rate (HR) increased 140 beats/min and peripheral oxygen saturation dropped to 80%. The patient was immediately intubated and transferred to the intensive care unit (ICU) for presumed hypovolemic shock. On admission, Hb level was 7.4g/dL, BP was 80/40 mmHg and HR was 120 beats/min. Surgical consult recommended exploratory laparotomy and performed subtotal gastrectomy with segmental duodenal resection.

The patient was treated with vigorous volume resuscitation, vasopressors, and antibiotics. The percutaneous tracheostomy was considered due to prolonged endotracheal intubation. Repeated transfusions of packed erythrocytes and platelet were indicated. Two days after the last transfusion, the blood bank notified our department that the platelet donor was subsequently diagnosed with Covid-19. Blood products were collected 3 days before the transfusion therefore the donor was healthy and no symptoms considering COVID-19.

The patient was tested for Covid-19 by real-time reverse transcription-polymerase chain reaction (RT-PCR); the repeated results were negative. The patient did not show any symptoms of infection or

evidence of pneumonia on chest computed tomography. Following successful weaning and decannulation of tracheostomy, he was discharged to the surgical ward on the 65th day of his admission.

DISCUSSION

The incubation period of COVID-19 is a debatable issue and it shows variability due to individual differences. World Health Organization reported that the incubation period of COVID-19 could be up to 14 days with an average of 5-6 days (9). In a report concerning people with confirmed SARS-CoV-2 infection outside Hubei province, China, the median incubation period was estimated approximately at 5 days and the development of symptoms occurred within 11.5 days in 97.5% of those contaminated patients. In this report, it's implied that 101 out of 10.000 cases would develop symptoms after 14 days of active monitoring or quarantine (10). This poses huge challenges in the timing of recruitment of blood and blood safety.

During previous global health threats caused by β -coronavirus named Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) coronavirus, the recommendations concerning blood safety were not sufficient (11). If we consider that the SARS-CoV-2 has many unknowns, more evidence is still needed about this issue. In the early phase of the SARS-CoV-2 outbreak, most blood centers and blood banks have taken some measures to ensure blood safety in China. The recommended precautions are taking the body temperature of the donor, screening questionnaire regarding whether the donor has any symptoms, calling back all blood donors, asking about the previous physical condition after donation, and recalling blood products collected from infected donors (12). It's stated that the use of pathogen inactivation technologies for minimizing the risk of virus transmission such as heat inactivation and/or denaturation at acidic or basic pH could be considered. However, these methods are not preferred due to the damage to blood components (11).

In Wuhan and other cities of Hubei province, the nucleic acid-based detection of SARS-CoV-2 and the isolation of collected blood for 14 days especially in high-risk areas have been added to the blood screening process. Precautionary measures must concern also the medical staff and they have to use adequate protective equipment in blood collection stations (13). European Center for Disease Prevention and Control (ECDC) suggests delaying the donation of blood for 21 days after any possible exposure to COVID-19 positive individuals or to avoid donation at least 28 days after completion of COVID-19 treatment and resolution of all symptoms (14). Meanwhile, The American Association of Blood Banks (AABB) and the Centers for Disease Control and Prevention (CDC) have no current recommendation concerning the SARS-CoV-2 pandemic for blood donation (15).

CONCLUSION

SARS-CoV-2 has spread rapidly in many countries throughout the world and the progress of the disease is worrying. Blood Services have a crucial role in global healthcare so; they should ensure blood safety in collaboration with public health institutions. Preparing the national guidance for the management of blood supply, taking special measures to maintain the safety assurance of donors and staff, and stricter measures in donor questionnaires are essential.

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