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Challenges and Strategies on Blood Banking and Transfusion Practices During the COVID-19 Pandemic: Ensuring Safe Use of Blood and Blood Products

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Abstract

The COVID-19 pandemic has profoundly impacted healthcare systems worldwide, including blood banking and transfusion practices, resulting in a decrease in the number of blood donors and transfusions. Several challenges faced by blood banks during the pandemic include a reduced donor turnout, shortage of blood products, increased workload, and shortage of staff. These issues have raised concerns regarding the adequacy and safety of the blood supply for patients requiring transfusion. Several strategies including mobile blood donation drives, increasing campaigns, and partnerships among blood banks and healthcare organizations were implemented to address the challenges faced during the pandemic

Keywords: Blood Banking, Problems in Blood Banks, Transfusion During Pandemic, Blood Bank Strategies

1. Introduction

The COVID-19 pandemic has posed significant challenges to healthcare systems worldwide. According to the American Association of Blood Banks (AABB), transfusion practices are among the many areas of healthcare that the pandemic has greatly impacted (AABB, 2020). There have been several reports of a decrease in blood donors and transfusions at the onset of the pandemic, raising concerns about the adequacy and safety of the blood supply for needy patients. In response, the World Health Organization (WHO) has implemented guidelines to ensure the safety of blood donation during the COVID-19 pandemic (WHO, 2020).

In this article, we aim to provide an overview of the challenges faced by blood banking and transfusion practices globally during the COVID-19 pandemic, including the decrease in blood donors, the impact on blood supply, and the risk of transmission of COVID-19 during blood donations. We also discussed the strategies implemented to address these challenges, such as using technology to screen donors and promoting convalescent plasma donation.

2. Review and Discussion

2.1 Donor Eligibility and Screening Protocols

Many countries implemented changes to donor eligibility criteria during the COVID-19 pandemic to ensure the safe use of blood and blood products. These changes aimed to mitigate the risk of transfusion-transmitted infections. Donor eligibility criteria were updated to exclude individuals with recent travel to high-risk areas or those with known exposure to COVID-19 cases (AABB, 2020). Furthermore, individuals who had tested positive for COVID-19 or exhibited symptoms were deferred from donating blood for a specific period, typically 14 to 28 days, to ensure they had fully recovered (AABB, 2020). Temperature checks, mandatory mask-wearing, and social distancing were some of the measures implemented to ensure the safety of donors and staff members during the donation process (AABB, 2020; WHO, 2020).

2.2 Blood Product Safety Measures

Blood banks implemented stringent safety measures to maintain the safety of blood products during the pandemic. Routine tests for infectious diseases, including COVID-19, were conducted to minimize the risk of transfusion-transmitted infections (AABB, 2020). Additionally, blood banks employed pathogen reduction technologies, such as ultraviolet light or chemical treatments, to further enhance the safety of blood products (WHO, 2020). These measures aimed to reduce the potential transmission of the virus through transfusions.

2.3 Challenges Faced by Blood Banks

One of the primary challenges was the decline in blood donations due to reduced donor turnout. Social distancing measures, lockdowns, and fear of exposure to the virus resulted in the cancellation of blood drives and decreased voluntary blood donations. Additionally, disruptions to the supply chain, including transportation restrictions, posed challenges in maintaining an adequate blood supply for healthcare facilities (WHO, 2020).

In Italy, by the first week of March 2020, there was a decrease of about 10% in whole blood donations per week; this numbered 43,000 nationwide compared to their standard donation number of 48,000 (Franchini et al., 2020). They maintained their inventory by temporarily lessening elective surgeries that used high amounts of blood. They also ensured that their reserves of blood kept for strict emergencies were not accessed at all. During the second week of the same month, after vigorous campaigning by their National Blood Center in partnership with their government, they had a 12% increase in whole blood collection, numbering 53,600 from 48,000 worldwide (Franchini et al., 2020).

In India, potential challenges encountered by blood banks include but were not limited to shortage of blood products, safety of blood donor and blood bank staff, and increased workload and shortage of staff (Arcot et al., 2020). In North China, decreased blood donations were a significant challenge owing to lockdown restrictions, and individual and familial apprehensions (Wang et al., 2022). The current challenges faced by blood centers can be related to donor recruitment, reimbursement or funding, the lack of a timely national warehouse capability, and staffing or labor (Association for the Advancement of Blood and Biotherapies, 2022). Other common challenges in blood donor recruitment include fear of contracting COVID-19 at blood donation facilities, inability to conduct donation drives due to lack of resources, and lockdown which has caused closure of public venues and cancellation of gatherings where blood drives are usually conducted (Al-Riyami et al., 2022).

2.4 Strategies Implemented

Blood banks and healthcare organizations implemented several strategies to address the challenges faced during the pandemic. Mobile blood drives and appointment-based donations were organized to encourage voluntary blood donations while ensuring adherence to social distancing guidelines (AABB, 2020). Public awareness campaigns were launched to educate the public on the importance of donating blood and to alleviate concerns about the safety of donating during the pandemic (American Red Cross, 2020). Collaboration between blood banks and healthcare

providers facilitated the collection and appropriate use of convalescent plasma from recovered COVID-19 patients, offering a potential treatment option for severely ill patients (WHO, 2020).

2.5 World Health Organization (WHO) on maintaining an adequate supply of blood and blood products during the COVID-19 Pandemic

The WHO report recommended several measures to prevent COVID-19 transmission during blood donation, including using PPE for blood donation staff and donors, social distancing measures during blood donation, and screening potential donors for COVID-19 symptoms and exposure history (WHO Interim Guidelines, 2020). WHO also recommends using convalescent plasma as a potential treatment option for severe cases of COVID-19 and recommends that blood centers consider collecting and storing convalescent plasma from eligible donors (WHO, 2020). Emphasis was made on promoting voluntary blood donation programs and technology to facilitate contactless blood donation.

The WHO recommendations were useful for blood centers and healthcare organizations worldwide to ensure the continued availability and safety of blood products during the COVID-19 pandemic. However, implementing these recommendations required additional resources and support, particularly in low- and middle-income countries (Pagano et al., 2020).

2.6 Use of Convalescent Plasma

Convalescent plasma, derived from individuals who have recovered from COVID-19 and developed antibodies, has emerged as a potential treatment option. This therapy involves transfusing plasma containing COVID-19-specific antibodies to patients with severe COVID-19 infection (WHO, 2020). Blood banks globally have collaborated with healthcare providers to collect convalescent plasma and ensure its appropriate use for COVID-19 treatment, following established guidelines and protocols.

Several case reports and case series show positive results regarding the utility of convalescent plasma for COVID-19 patient treatment. A study on the different safety metrics after the transfusion of ABO-compatible human COVID-19 convalescent plasma to 5000 hospitalized adults who had a severe or near-life-threatening case of COVID-19 suggested the early safety indicator of COVID-19 convalescent plasma (Joyner et al., 2020). A study by Hartman et al. on 31 patients demonstrated that convalescent plasma reduced ventilatory requirements in patients with both severe and life-threatening diseases (Hartman et al., 2020).

2.7 Promotion of Voluntary Blood Donation

During the COVID-19 pandemic, the promotion of voluntary blood donation was crucial to address the decline in blood donations and ensure an adequate blood supply (WHO, 2020). Blood banks and healthcare organizations implemented various strategies to encourage individuals to donate blood voluntarily while adhering to safety protocols.

One approach was the organization of mobile blood drives and temporary donation centers (WHO, 2020; Miah, 2022; Oreh et al., 2022). These initiatives aimed to bring the donation process closer to potential donors, making it more convenient and accessible. Mobile blood drives can be organized in different locations, such as community centers, schools, and workplaces, allowing individuals to donate blood without traveling to a fixed blood center (WHO, 2020).

Strict hygiene and infection control measures were implemented to ensure the safety of donors and blood bank staff during the pandemic (WHO Interim Guideline, 2020). Donor screening protocols were strengthened to identify potential COVID-19 cases and individuals at higher risk of exposure. Temperature checks, mandatory mask-wearing, hand hygiene, and social distancing measures were implemented at donation sites to minimize the risk of COVID-19 transmission.

Public awareness campaigns were vital in promoting voluntary blood donation during the pandemic (Wang et al., 2022). These campaigns utilized various channels, including social media, television, radio, and print media, to disseminate information about the importance of blood donation, the safety measures in place, and the ongoing need for blood despite the pandemic (Sümmig et al., 2018; WHO, 2020; Wang et al., 2021; Wang et al., 2022). Messages focused on the critical role of blood donors in saving lives and emphasized that donating blood is a safe and essential activity.

In Italy, the Italian National Blood Centre (CNS) continued reinforcing its interest in donating blood products in public hospitals and their different associated collection sites for the smooth and proper collection of blood units involving different donors and healthcare personnel (Franchini et al., 2020). Additionally, partnerships and collaborations between blood banks, healthcare providers, and community organizations were forged to strengthen the promotion of voluntary blood donation (AABB, 2020; WHO, 2020). These collaborations involved engaging with community leaders, conducting educational sessions at schools and colleges, and organizing special donation events targeting specific groups, such as first responders or recovered COVID-19 patients eligible for convalescent plasma donation (WHO, 2020).

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