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COVID-19 and Blood Safety: Help with a Dilemma

Many of us remember the extraordinary outbreak of Severe Acute Respiratory Syndrome (SARS) in 2002 to 2003 and will recall the hurried responses to allay the possibility of transfusion transmission. These actions were taken in the face of uncertainty, along with the explosive and unprecedented nature of the epidemic, without any obvious method of control and more questions than answers. This then repeated 10 years later with another zoonotic coronavirus (CoV), named Middle East Respiratory Syndrome (MERS) virus. Now once again, we are facing a similar, but much larger, outbreak of yet another novel coronavirus. Due to its relationship to SARS-CoV, the 2019 novel CoV has been designated as **SARS-CoV-2** and the associated disease, **COVID-19**, Fig. 1. We are not aware of any prior evidence of transfusion transmission of either SARS-CoV or MERS-CoV. And we are not aware of any current evidence of transfusion transmission of SARS-CoV-2, but is there more that we can learn as we ponder this new challenge? In this issue of *Transfusion Medicine Reviews*, Dr Lunan Wang and her colleagues have reviewed relevant publications about these novel coronaviruses, providing information that, while not entirely reassuring, should provide material help for rational decision-making as the epidemic evolves.

There are a number of key questions that must be asked to determine whether a blood safety intervention is needed. The primary one is, of course, whether or not the virus is transmissible by transfusion, and, if it is, whether there is an asymptomatic, but viremic period that would pose a risk to transfusion recipients. Even when we conduct horizon scanning for emerging infectious disease agents posing a potential threat to transfusion safety, we cannot predict their evolution or outbreak potential, and much time is needed to answer critical questions conclusively. The review by Wang clearly shows that for all three novel coronaviruses, nucleic acids are found in the serum or plasma, and in one instance, lymphocytes, of patients with clinical disease. Even fecal transmission was considered possible in the case of SARS-CoV. It is not clear, however, that these findings establish the infectivity of blood. It also remains unknown if there is viremia (i.e., infectious virus in plasma) prior to clinical disease or during asymptomatic infection. And if viremia occurs, is it of sufficient quantity to result in human infection, and if so, under what conditions? One study from Hong Kong did, however suggest that asymptomatic infection with the SARS-CoV could occur. At the time of writing (February 15, 2020), it is unclear whether SARS-CoV-2 can be transmitted from those with pre-symptomatic or asymptomatic infection.

In the context of interventions, Wang provides a useful summary of the efficacy of current pathogen reduction technology in limiting coronavirus titers. She also reviews the measures currently being taken by blood collecting organizations in China. These include: body temperature measurement; screening questions for symptoms or potential exposure; active post-donation information gathering; and product tracing and recall where indicated. More generally, many airports

have begun screening travelers for fever (Fig. 2). Similarly, the US Food and Drug Administration released a “consideration” document (February 4, 2020) suggesting donor education and a 28-day self-deferral for travel to outbreak areas, having a diagnosis of or suspected with a COVID-19 diagnosis or having lived with someone who has, along with associated product retrieval actions for all except travel. For SARS-CoV in the United States, the FDA eventually required more, with the release of “Guidance for Industry” in 2003 including specific donor questions related to travel, infection or contact. The question in the era of uncertainty is whether these actions provided additional safety in the face of unknown risk and what are the appropriate actions now, while the threat level in most areas outside of China is generally low for now.

Dr Wang and her colleagues conclude that absence of risk to transfusion cannot be assured and that appropriate interventions and continued surveillance are needed. Further, we are reminded that it is also necessary to consider the safety of donors and staff in blood centers. For those of us in countries where there are few cases, advice to

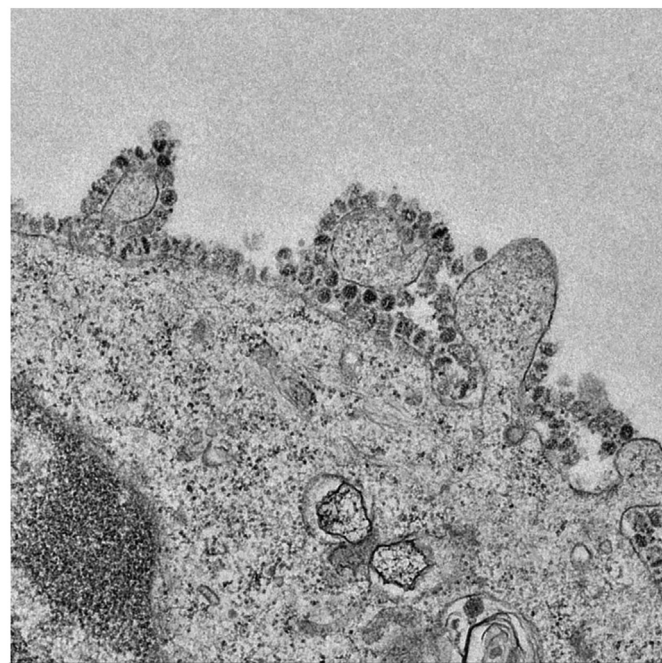


Fig. 1. Electronmicroscopic image of SARS-CoV-2). Credit: John Nicholls, Leo Poon and Malik Peiris, The University of Hong Kong.

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Fig. 2. Airport screening for infectious disease. Credit: CBS news.

maintain surveillance and to establish triggers for further intervention would seem to be wise.

These remarks represent the opinions of the authors, and do not necessarily reflect those of the American Red Cross.

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