

SARS-CoV-2 and blood donations in Portugal, June–July 2020

To the Editor,

More than a year has passed since the emergence and worldwide spread of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2); the new coronavirus belonging to the *Betacoronavirus* genus^{1–4} has caused more than three million confirmed deaths up until June 2021.³

Although most patients infected with COVID-19 develop only mild to moderate symptoms, some remain asymptomatic during infection without any clinical symptoms and signs.⁵ However, despite showing no clinical signs of disease, asymptomatic patients can still be a potential source of SARS-CoV-2 in droplets and aerosols. Therefore, they could be missed by detection strategies, posing a threat to infection control and making it difficult to accurately estimate the spread of the virus among the population.⁶

Respiratory viruses are known not to be transmitted by blood transfusion, and to date, there have been no reported cases of transfusion-transmitted SARS-CoV-2 worldwide.^{7,8} Despite this, a few studies have reported SARS-CoV-2 RNA in blood donors.^{9–11} Similarly, SARS-CoV and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) RNA have been detected in plasma and serum of infected patients,^{12,13} but transfusion transmission has not also been reported.^{8,14} In this context, the present work aimed to evaluate the presence of SARS-CoV-2 RNA in blood donations. The immune status of the donors regarding anti-SARS-CoV-2 immunoglobulin M (IgM) was also evaluated.

Blood samples ($n = 543$) were collected during blood donations by a major hospital in the North of Portugal, between June and July 2020. Upon blood donations, each donor provided another 5 ml blood sample that was collected in an individual tube and plasma was separated. Information regarding sex and age from the donors was not recorded. Ethics approval was obtained from the Ethics Committee (CHVNG/E Reference number 116/2020). All plasma samples were screened for IgM anti-SARS-CoV-2 using a commercial enzyme-linked immunosorbent assay (ELISA) (Abbott ARCHITECT SARS-CoV-2 IgM on Architect® i2000SR), which detects antibodies against nucleocapsid SARS-CoV-2 protein. In addition, for the detection of SARS-CoV-2 RNA, viral RNA was extracted from each plasma sample with QIAamp Viral RNA Mini kit (Qiagen) and tested individually by RT-qPCR using a commercial assay (Xpert qDetect COVID-19, GRISP) that targets two regions of the SARS-CoV-2 genome (N1 and N2) and includes an RNaseP (RP) target for the control of the RNA extraction.

From the 543 plasma samples tested, seven were positive to IgM anti-SARS-CoV-2 (evidence of current or recent infection), giving an overall seroprevalence of 1.2% (95% confidence interval: 0.52–2.64).

Based on these results, the possibility of COVID-19 asymptomatic donors having been considered for blood donation cannot be excluded. This could pose, to a certain extent, a risk for COVID-19 to other donors and workers at the blood center when sharing common facilities. However, to clarify this risk, nasopharyngeal samples from donors have to be taken and tested for the presence of SARS-CoV-2 since a positive IgM does not necessarily signify the presence of SARS-CoV-2 in the respiratory tract. Moreover, since the ELISA test used detects IgM antibodies to the SARS-CoV-2 nucleocapsid protein, the possibility for cross-reactions with other coronaviruses cannot be excluded and a confirmatory virus neutralization test would provide a more specific output.

Concerning the detection of SARS-CoV-2 RNA, all the 543 samples were negative. This finding was not unexpected since SARS-CoV-2 viremia is extremely rare in asymptomatic and, when found, viral RNA levels were very low.^{11,15} Moreover, until today there are no reported cases of transfusion-transmitted SARS-CoV-2. That being said, the potential for transmission of SARS-CoV-2 through blood and blood components is considered to be unlikely but not completely deniable. Regulatory agencies such as the European Centre for Disease Prevention and Control recognize that transfusion transmission cannot be excluded entirely but remains theoretical,¹⁶ with most of the guidelines regarding transfusion transmission focusing on selecting the appropriate candidates for blood donation, preventing transmission through the already established transmission routes (droplet and airborne) during blood donation, and maintaining a robust blood supply for ongoing transfusion needs and related business continuity imperatives.¹⁷ Also, the World Health Organization's current guidelines regarding blood donation do not recommend the screening for SARS-CoV-19 RNA and instead, the focus is given to minimizing transmission of SARS-CoV-19 to donors and staff during blood donation.⁸

In conclusion, albeit the absence of viremia in blood donations in Portugal, the present study reports blood donors positive for anti-SARS-CoV-2 IgM at the time of the donation. Further studies are needed to assess the occupational exposure of blood bank workers to asymptomatic COVID-19 blood donors.

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AUTHOR CONTRIBUTIONS

João R. Mesquita, Helena Cruz Gomes, Álvaro Monteiro, Maria São José Nascimento: conceptualization, supervision, validation, visualization, writing—original draft, writing—review and editing. Patrícia Barradas, Priscilla Gomes da Silva, Ana Sofia Ferreira, Raquel Duarte: conceptualization, investigation, writing—original draft. Eliane Silva, Isabel M. Matas, Gertrude Thomson, Irina Amorim: investigation, visualization, writing—original draft. All authors have accessed verified the underlying data.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding authors upon reasonable request.

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