



Abnormal echocardiographic findings after COVID-19 infection: looking for an appropriate balance

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To the editor,

We read the editorial by Singh et al. about our registry with great interest. We thank the authors for their interest in our project and publication [1]. We would first like to respond to the inquiry about performing echocardiography on asymptomatic patients. As per our methods section, patients underwent echocardiography at our center for a variety of reasons [2]. Due to the COVID-19 lockdowns during the registry development, patients were past 14 days of confirmed COVID-19 infection by a polymerase chain reaction (PCR) test before they had an echocardiogram. In Argentina and Brazil, there was no indication to repeat a PCR for COVID-19 after an initial positive test, given that this strategy had not shown any advantage in prognosis and management. Accordingly, the time interval between the COVID-19 infection and the echocardiographic examination was influenced by physician referral time of the test. Given that we did not intervene in the decision to request any study for the patients included in our registry, we performed a non-probabilistic sampling, as described previously.

Concerning the objective of our registry, our original publication stated that “we aimed to explore the prevalence of echocardiographic cardiac abnormalities in ambulatory patients after recovery of a first documented COVID-19 infection”. That is why we included patients with different

disease severity, as most groups have done previously. Another misconception seems to be the lack of demographic information about the included patients. Beyond the baseline characteristic we described in **Table 1**, we detailed that “we included 595 participants who recovered from a COVID-19 infection with an average age of 45.5 ± 14.9 years, of which 50.8% were female. The majority of patients (82.5%) had the disease at home [...]”. We also gave the precise information that “the mean body mass index in the patients was 26.8 ± 4.8 kg/m², and 61.7% of the participants denied any relevant medical history. The most frequent comorbidity was arterial hypertension (28.6%)”. The supplementary data also reported the time elapsed from the patient’s recovery after COVID-19 infection and echocardiographic examination.

Maybe the most provocative discussion is about the role of echocardiography after a COVID-19 infection. We agree with Singh et al. that the echocardiogram is a relatively expensive examination and not widely available in many regions of the world. In this line, the electrocardiogram is a well-known cost-effective tool to assess cardiovascular abnormalities in many diseases, even COVID-19. However, it is critical to note that in most diseases, the accuracy of the electrocardiogram to detect abnormalities is influenced by the knowledge and skills of those who evaluate it. During the first wave of COVID-19, there was great uncertainty about cardiovascular involvement after the disease. Thus, some initial research stated that most patients had some cardiovascular involvement after COVID-19 infection, even asymptomatic patients. That led many groups, like ours, to explore this possibility with different methods. In this scenario, we believe that the echocardiogram with global longitudinal strain represents a valuable balance between the sensitivity and specificity to detect cardiovascular abnormalities at a relatively low cost compared with more sophisticated tests. Our study showed that less than one in eleven patients had any echocardiographic abnormality. The most

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frequent was reduced left or right ventricle global longitudinal strain value, representing a subclinical affectation. We believe this observation is in line with daily practice.

Finally, we have not advocated for performing an echocardiogram on each patient after COVID-19 infection. Our study suggests that cardiovascular abnormalities after a COVID-19 infection are infrequent and usually mild. We are convinced that in the post-COVID era, perhaps the most significant challenge we are facing is to strike the balance between over-testing and underdiagnosing our patients.

Declarations

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Compliance with Ethics Guidelines This article is based on previously conducted studies and does not contain any new studies with human

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