



## EDITORIAL COMMENT

## Arrhythmias in COVID-19. Do they influence outcomes in hospitalized patients?

### Arritmias na COVID-19. Têm impacto prognóstico nos doentes hospitalizados?

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The SARS-CoV-2 pandemic infection has been reported in 223 countries, with about 136 million cases and almost 3 million deaths since December 2019.<sup>1</sup> Although the real mortality associated with COVID-19 remains unknown, the current global case fatality reported across countries ranges from 0.2% (in Germany) to 7.7% (in Italy).<sup>2</sup> Cardiovascular disease, diabetes and age have been outlined as risk factors for poorer outcomes in COVID-19 patients.<sup>3</sup>

The clinical presentation varies widely, from asymptomatic or mild flu-like symptoms to acute severe respiratory distress syndrome and systemic complications impacting several organs. Cardiovascular complications from COVID-19 infection are being reported more frequently, ranging from silent myocardial injury to thromboembolic events, acute coronary syndromes, cardiogenic shock and arrhythmias.<sup>4</sup>

Arrhythmias have been described in 17% of the hospitalized cases and in almost 50% of patients in the intensive care units (ICU), probably with a potential contribution to a higher risk of adverse outcomes, with an increased risk of in-hospital death.<sup>5</sup> There are various reported series of different types of arrhythmias, including bradycardia (less

common), sinus tachycardia and atrial arrhythmias (atrial fibrillation [AF] and atrial flutter) and ventricular dysrhythmias, including cardiac arrest.<sup>4,6</sup>

In the study ‘‘Cardiac arrhythmias in patients presenting with COVID-19 treated in Portuguese hospitals. A national registry from Portuguese Association of Arrhythmology, Pacing and Electrophysiology’’, published in this issue of the *Journal*, Dinis Mesquita et al. present the results of a survey conducted by the Portuguese Association of Arrhythmology, Pacing and Electrophysiology to assess the occurrence of arrhythmias in COVID-19 patients in 20 Portuguese hospitals.<sup>7</sup> They report data from 692 hospitalized patients, with arrhythmic episodes in 11.7% of the cases, including paroxysmal supraventricular tachycardia, atrial flutter and AF (the most common, being recurrence of previously existing arrhythmia in 35.9%), bradycardia and ventricular tachycardia. Surprisingly, none had arrhythmia-related complications nor arrhythmic death despite their elderly age (mean 73.5 years; minimum 61, maximum 80.3), associated comorbidities in a large majority of the reported arrhythmias (79.7%), and more severe COVID-19 disease, with mechanical ventilation, hemodynamic instability and multiple organ failure (in those patients with supraventricular arrhythmias) and high mortality rate (31.3%).

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Although continuous cardiac rhythm monitoring was obtained only in the subgroup of 393 patients admitted to the ICU or with continuous cardiac monitoring, with detailed information available limited to 79% of the cases with documented arrhythmias, these are useful real clinical data for our understanding of the severity and impact of arrhythmias in COVID-19 infection.

The survey also reports the assessment of QT interval during hospital admission in 443 patients under therapy with ritonavir/lopinavir, hydroxychloroquine or azithromycin. Interestingly, despite medication capable of QT prolongation in 76.6% of the cases with arrhythmias, only seven patients (10.9%) had an increased QTc interval (ranging between 480 ms and 596 ms).

As pointed out by the authors, the availability of continuous cardiac monitoring in only 56.8% of the population poses strong limitations to the conclusions of the registry. Of course, it seems that the occurrence of arrhythmias (mostly supraventricular) is a common finding, particularly in patients with co-morbidities and more severe COVID-19 manifestations, but data from the whole population could identify clinical variables associated with higher risk of new onset (or reappearance) of arrhythmias, and contribute to a better approach to this specific group of patients.

According to the most recent literature, risk factors for the appearance of arrhythmias are: respiratory insufficiency, myocardial strain and ischemia or myocarditis, cardiogenic shock, sepsis or systemic inflammation, hyperactivity of the sympathetic nervous system, hypercoagulability status, electrolyte disturbances, and proarrhythmic drug side effects.<sup>4,6,8</sup> Therefore, the incidence of arrhythmias in patients with COVID-19 is a likely consequence of systemic

illness and not solely the direct cardiac effect of the infection.

## Conflicts of interest

The author has no conflicts of interest to declare.

## References

1. WH Organization. WHO Coronavirus Disease (COVID-19) dashboard; 2021. Available from: <https://covid19.who.int/?gclid=EAlalQobChMI65aDxPW57QJVEJntCh3SxgWwEAAAYASAAEgLOZvD.BwE> [accessed 13.04.21].
2. Lazzarini M, Putoto G. COVID-19 in Italy: momentous decisions and many uncertainties. *Lancet*. 2020;8:e641–2.
3. Cordero A, Garcia-Gallego C, Bertomeu-González V, et al. Mortality associated with cardiovascular disease in patients with COVID-19. *REC CardioClinics*. 2021;56:30–8.
4. Trêpa M, Reis H, Oliveira M. Cardiovascular complications of COVID-19 infection: a brief review. *Acta Médica Portuguesa*. 2021 [in press].
5. Bhatla A, Mayer MM, Adusumalli S, et al. COVID-19 and cardiac arrhythmias. *Heart Rhythm*. 2020;17:1439–44.
6. Babapoor-Farrokhran S, Rasekhi RT, Gill D, et al. Arrhythmia in COVID-19. *SN Compr Clin Med*. 2020:1–6.
7. Mesquita D, Carmo P, Cabanelas N, et al. Cardiac arrhythmias in patients presenting with COVID-19, treated in Portuguese hospitals. A national registry from APAPE. *Rev Port Cardiol*. 2021;40.
8. Dherange P, Lang J, Qian P, et al. Arrhythmias and COVID-19: a review. *JACC Clin Electrophysiol*. 2020;6:1193–204.