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Perspective

# Arrhythmias in COVID-19 Patients

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Coronavirus disease-2019 (COVID-19) pandemic, caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), is disrupting everyone's life and putting a huge strain on health services around the world. The spectrum of symptoms of SARS-Cov-2 infection may vary from asymptomatic to severe disease, with a very high mortality [1-3]. Although pneumonia and respiratory illness are by far the most important clinical manifestations of COVID-19, it has been observed that, among other comorbidities, cardiovascular diseases increase the risk of severe illness and mortality [4]. Also, acute COVID-19 cardiovascular syndrome, characterized by a variety of clinical presentations such as ventricular and supraventricular arrhythmias, cardiomyopathy, and hemodynamic instability has been described [5]. Among cardiovascular manifestations reported in patients with COVID-19, cardiac rhythm disturbances are frequent. In a study of 137 patients from Hubei province, China, palpitation as one of the initial symptoms was observed in 10 subjects (7.3%) [6]. In a study, including 138 patients admitted to hospital for SARS-Cov-2-related pneumonia, arrhythmias were reported in 17% of the general cohort; in patients admitted to an intensive care unit this percentage raised to 44% [7], suggesting that cardiac arrhythmias may be more common in critically ill COVID-19 patients.

Among different types of tachyarrhythmias observed in COVID-19 patients, sinus tachycardia is the most common; supraventricular tachycardias, including atrial flutter and atrial fibrillation, as well as ventricular arrhythmias are also reported; bradyarrhythmias, including sinus pauses or high-grade heart block, are less frequent [8].

A meta-analysis by Ferreira., *et al*. published in this issue of *EC Cardiology* [9] included six studies with a total of 2232 COVID-19 patients, evaluated the incidence of tachyarrhythmias in patients with COVID-19 infection, and their implications for the patient outcome. They found that supraventricular arrhythmias were a frequent finding; though, arrhythmia-related mortality was not significantly increased in these patients. Particularly, overall tachyarrhythmias incidence was 7.9%; supraventricular tachycardia, including both atrial fibrillation and atrial flutter, occurred in 5.04%; the incidence of ventricular tachycardia was 0.95% [9]. Although these data do not reveal a higher mortality directly associated with tachyarrhythmias, they confirmed that cardiac rhythm disturbances are very common and represent a relevant clinical problem in patients with COVID-19, with potential practical implications in patient management.

Arrhythmias are not just due to the direct effect of SARS-CoV-2 infection, but probably derived by the presence of a systemic illness [10]. Patients may be tachycardic for other conditions, such as fever or pain. Several possible causes have been involved in arrhythmogenesis associated with COVID-19 infection, such as extracardiac processes that may induce arrhythmias in patients with predisposing condition or chronic cardiovascular disease, myocardial injury, reduced cardiac reserve and increased metabolic demand [10,11]. Also, the trigger of cardiac arrhythmias among COVID-19 patients may include myocarditis, hypoxia caused by pulmonary involvement due to the infection, disruption of immune response, pulmonary hypertension and resulted myocardial strain, electrolyte disorders and drug sides effects [10,11].

Due to few studies available about the management of arrhythmias in confirmed COVID-19 cases, the treatment should be similar to any patient with arrhythmia due to other conditions. Nevertheless, many drugs used in the treatment of COVID-19 may be responsible to drug-drug interactions with antiarrhythmic drugs [12]. Therefore, the use of these drugs requires special attention in the treatment, management, and monitoring strategies for COVID-19 patients.

As COVID-19 pandemic causes persistently significant morbidity and mortality, further studies are needed to clarify the effects of Sars-Cov-2 infection on the conduction system and cardiac rhythm disturbances. Until the management of COVID-19 patients with cardiac arrhythmias will be better defined, clinical judgment and physician experience are crucial in the treatment of these patients.

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