Cardiac arrhythmias in COVID-19: Mechanisms, outcomes and the potential role of proarrhythmia

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Cardiac arrhythmia seems to be a risk factor for mortality in coronavirus disease 2019 (COVID-19). However, the mechanisms, risk factors and outcomes of new arrhythmic events (NAEs) in this disease are unclear.

Methods: All patients with confirmed COVID-19 were retrospectively included in this single centre study. Patients who were alive and admitted <30 days before the database lock were excluded.

Results: 3416 consecutive patients were reviewed and 1476 finally enrolled (65.9 ± 20.9 years, 57.3% male). 76 (5.1%) patients had NAEs. Most of them were new atrial fibrillation episodes (48 patients, 3.2%), mostly seen in patients with no previous arrhythmia (38 patients, 79.2%). Atrial flutter (AFL) accounted for 20% of all NAEs. Ventricular arrhythmias were seen in 9 (0.6%) patients. Multivariable analysis showed that prior AFL, heart failure, dyslipidaemia, lopinavir/ritonavir, and combined hydroxychloroquine and azithromycin were independently associated with NAEs. 66 (86.8%) patients with NAEs died. The Kaplan-Meier analysis showed a lower survival of patients with NAEs ($P < 0.001$). Eight out of 9 (88.9%) and 41 out of 48 (85.4%) patients with ventricular arrhythmias and atrial fibrillation respectively died. Older age, male gender and NAEs were independently associated with death. NAEs and other outcomes, such as heart failure, thromboembolism, and bleeding independently predicted death.

Conclusions: NAEs are relatively uncommon in COVID-19 patients and mainly have an atrial mechanism. AFL is particularly frequent in this disease. The use of hydroxychloroquine, azithromycin and lopinavir/ritonavir, is associated with them, especially when used in combination. NAEs are independently and strongly associated with death.

Abstract Figure.