

# Cardiac Follow-Up in Patients with COVID-19

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**Cite this article as:** Comert B. Cardiac Follow-Up in Patients with COVID-19. J Crit Intensive Care 2020; 11(Suppl. 1):46–47.

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**Received:** Jun 17, 2020

**Accepted:** Jun 18, 2020

**Available online:** Jun 22, 2020

## ABSTRACT

Although major clinical manifestations of coronavirus disease (COVID-19) is related with respiratory system, major cardiac complications such as myocardial injury, arrhythmias are reported in many publications. Another remarkable finding related with COVID-19 is the relation between hypertension and disease severity and mortality.

**Keywords:** COVID-19, Myocardial injury, Hypertension, Arrhythmia

## Introduction

Despite the mortality rate of The novel coronavirus disease 2019 is less than SARS-CoV and MERS-CoV, it is very contagious. Thus, it affects large number of people all around the World. Although major clinical manifestations of COVID-19 is related with respiratory system, the disease may affect many major organ systems such as cardiovascular, gastrointestinal, renal, and central nervous system. Wang et al. reported that they observed acute cardiac injury, shock, and arrhythmias in 7.2%, 8.7%, and 16.7% of patients with COVID-19, respectively(1).

## Myocardial injury

Myocardial injury represented as elevated cardiac troponin(2) levels were frequently seen in patients with COVID-19 admitted to hospital. But the exact reason of myocardial injury is not known. Troponin levels may have prognostic value and may serve as a useful clinical follow-up tool for patients who develop myocardial injury (such as heart failure or arrhythmia). Presumed causes of myocardial injury in patients with COVID-19 include myocarditis(3), hypoxic injury, stress cardiomyopathy, ischemic injury caused by cardiac microvascular damage or epicardial coronary artery disease, right heart strain(4), and systemic inflammatory response syndrome. Myocardial biomarkers should be evaluated in all patients with COVID-19 for risk stratification and prompt intervention.

The patients should be evaluated rapidly for emergent coronary intervention if the clinical presentation is suggestive of acute coronary syndrome. Most patients with COVID-19 without suspected ACS with mild troponin elevation, and without acute heart failure can be clinically monitored without cardiac imaging. Patients with new onset heart failure, echocardiogram may be performed to evaluate regional and global ventricular and valvular function.

A natriuretic peptide level (B-type natriuretic peptide [BNP] or N-terminal proBNP) is obtained in patients with suspected heart failure if the diagnosis of heart failure is uncertain(5).

## Hypertension

There are many reports about hypertension as a risk factor for COVID-19 infection. According to up-to-date knowledge hypertension is accepted as one of the risk factors associated with severe disease and mortality(6). Cohort studies aimed to reveal the relation between hypertension and age in patients with COVID-19 are needed.

It is well known that SARS-CoV-2 spike protein uses the ACE2 receptor to enter the cell. However, there is no evidence to support an association between renin angiotensin system inhibitor use and more severe disease. Patients receiving angiotensin-converting enzyme (ACE

inhibitors or angiotensin receptor blockers (ARBs) should continue treatment with these agents. There is no evidence that stopping ACE inhibitors or ARBs reduces the severity of COVID-19(7).

### Arrhythmia

Most of the patients with COVID-19 does not have signs and symptoms related with arrhythmia or conduction system disturbances. However, arrhythmias may be seen in patients with myocarditis, myocardial ischemia, hypoxia, shock, or who are receiving QT prolonging therapies(8).

All patients in whom COVID-19 is suspected should have a baseline electrocardiogram (ECG) performed at the time of admission to the hospital(9). Ideally, this would be a 12-lead ECG, but a single- or multi-lead ECG from telemetry monitoring may be adequate in this situation to minimize staff exposure to the patient(10).

Patients with sustained TdP usually become **hemodynamically unstable, severely symptomatic, or pulseless** and should be treated according to standard resuscitation algorithms. Patients with TdP who are **hemodynamically stable on presentation** may remain stable or may become unstable rapidly and without warning. Treatment with IV magnesium along with correction of metabolic/electrolyte derangements and/or removal of any inciting medications may be sufficient.

The patient's baseline QTc value should be obtained prior to administering any drugs with the potential to prolong the QT interval. If two to three hours after a dose of hydroxychloroquine or other QT-prolonging agent, the QTc increases to  $\geq 500$  milliseconds or if the change in QT interval is  $\geq 60$  milliseconds, there should be a reevaluation of the risk of TdP versus benefit of the medication. Increment in QT interval for 10 milliseconds causes an 5-7% increase in risk of TdP development should not be forgotten.

### Conclusion

COVID-19 is not only the disease of respiratory system but also it involves many systems such as cardiovascular system. Many cardiac complications can be easily seen with the disease including myocardial injury and arrhythmies

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