




## COVID-19 and Heart

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Received 2020 May 02; Accepted 2020 May 06.

*Keywords:* COVID-19, Heart Disease, ECMO

A viral pandemic has hit the globe unexpectedly, the number of COVID cases continues to rise and most of us track the statistics. Data published from Chinese centers mainly “Wuhan” where the pandemic was firstly originated and also from Italy in Europe has demonstrated that cardiac injury is a prominent feature of this disease, occurring in 20% - 30% of hospitalized patients and 40% of mortalities (1-3).

We know that some viruses have the tendency to affect the heart, also COVID-19 has a particular affinity for myocardial tissue. The virus uses the so called “ACE” receptors to enter the cell and these receptors exist in lung and myocardial cells (4).

Although the cardiac involvement has been shown in many reports, the data specific to different heart disease and COVID-19 is lacking.

Heart function can decrease via two major mechanisms: direct invasion of cardiomyocytes with virus (viral myocarditis) and the systemic inflammatory response syndrome triggered by viral infection, also the systemic hypoxemia and organ failure are contributory.

Patients with heart disease are more likely to experience myocardial injury with COVID virus and these patients have a higher risk for mortality (5-7).

Patients with advanced heart disease like heart failure, are most probably at the greatest risk because they are less tolerant to any insult with borderline organ function.

There are many studies which show the rise of biomarkers of myocardial injury such as sensitive troponin and also the inflammatory biomarkers such as C-reactive protein and interleukin-6 in a subset of patients. Patients with myocardial involvement have higher mortality and hospital stay (6, 7). Even some consider myocardial injury as a predictor of COVID-19 fatality (8).

There are many reports from all around the world that indicate the “STEMI” cases have declined dramatically and mysteriously, what has happened? There are also some fake STEMIs which indeed are cases of myocarditis who pre-

sented with acute chest pain and dyspnea.

Patients with cardiovascular complaints or concerns may not be presenting to hospitals because they are afraid of COVID-19. On the other hand overcrowded hospitals and emergency rooms may be the reason for missing such patients.

Two factors should be considered in the management of these patients: Firstly, there is still no proven treatment for the disease and secondly, there is a potential risk of some medications which have been suggested like “hydroxychloroquine”.

FDA has recently approved “ECMO” to treat COVID patients. In a study on ECMO for ARDS patients with “Middle East respiratory syndrome corona virus” (MERS-COV), a similar corona virus disease emerged in 2012, ECMO showed significant benefit regarding in-hospital mortality and ICU stay (9). However early results with ECMO in COVID-19 victims are disappointing and it is assumed that the combination effect of systemic inflammatory response triggered by both viral infection and extracorporeal circulation counterbalance the survival benefit.

Based on recent studies the outcomes of ECMO in COVID-19 patients are not promising, but due to limited experience, the heterogeneity of patients and protocols, this has remained as a big challenge and we should encourage the other centers to share their experience on ECMO patients in order to clarify the role of ECMO in the management of these critically ill patients. The other concern for ECMO utilization is resource setting and the availability of trained nurses and perfusionists in the tough situation of hospitals in the hot spots for the disease.

At the end, this is a global problem and requires a global solution which cannot be achieved except for sharing the knowledge and doing the responsibilities by all of us, to emphasize this, as we proposed a slogan to World Health Organization (WHO) few days ago: “COVID needs cowork”.

## Footnotes

**Conflict of Interests:** The authors of this manuscript declare no conflicts of interest.

**Funding/Support:** There was no funding or support to declare for this manuscript.

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