

Acute Respiratory Impacts of COVID-19 on the Cardiovascular System

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DESCRIPTION

The involvement of various systems, particularly the cardiovascular system, has shown considerable morbidity in COVID-19. Myocardial damage, myocardial infarction, venous thromboembolic events, myocarditis, Takotsubo syndrome, and other arrhythmic events are all possible cardiovascular symptoms in the acute phase. Multiple studies have discovered a prevalence of roughly 20% of myocardial damage as indicated by the elevation of cardiac biomarkers in blood. Its presence is linked to poor clinical outcomes and death in hospitals. Myocardial damage mechanisms have been the focus of much subjects, although they remain unclear. The use of echocardiography and cardiac magnetic resonance to characterise cardiac disease has had mixed results in several studies, with a high prevalence of imaging criteria for myocarditis.

The persistence of symptoms and imaging modifications in recovered COVID-19 patients has prompted concerns regarding the length and potential importance of these findings in post-acute and chronic follow-up data. Even while understanding of this disease has vastly improved in the previous year, many aspects remain unknown and require additional research.

Coronavirus Disease 2019 (COVID-19) has become a public health issue in practically every country on the planet, producing social and economic issues. Due to the pandemic's rapid spread and severe morbidity in some populations, health systems have been overburdened, with high mortality rates even in wealthy countries like the United States, where COVID-19 was the third highest cause of death in 2020 [1,2].

The Severe Acute Respiratory Syndrome Coronavirus-2 causes COVID-19 (SARS-CoV-2). Acute Respiratory Distress Syndrome (ARDS) and systemic severe inflammatory response were the key pathophysiologic mechanisms of this virus [3]. One of the initial findings at the start of the pandemic was that individuals with comorbidities, such as pre-existing cardiovascular illness, had a poorer clinical result, including a greater chance of mortality [4]. As the pandemic progressed, many studies raised concerns about COVID-19's potential for multisystem and cardiac involvement.

There is an application of information concerning COVID-19's cardiovascular effects during the acute phase of the disease. Meanwhile, there is a lack of data on the post-acute and chronic periods. Furthermore, it is uncertain if cardiac involvement during the acute phase of COVID-19 has a clinical influence on the long-term prognosis, such as deteriorating or acquiring new heart problems.

The aim of this study is to synthesis the available research on COVID-19's acute and chronic cardiovascular effects. It will discuss the possible pathophysiologic mechanism involved, as well as acute cardiac symptoms, cardiac imaging results, and data on COVID-19's post-acute and chronic effects on the cardiovascular system.

CONCLUSION

The cardiovascular system has been intimately related to the COVID-19 epidemic since its inception. Acute cardiovascular involvement, such as myocardial infarction, ACS, myocarditis, and PE, is associated with poor short-term results and death. Several mechanisms are most likely involved. However, cardiac injury appears to be multifactorial, with impaired RAAS regulation, inflammation, and coagulopathy diseases all playing a role. In the acute and post-acute periods, imaging studies, particularly CMR, have yielded reliable information regarding structural and functional alterations. Furthermore, this diagnostic tool will be critical in long-term cardiac involvement evaluations. COVID-19 survivors may encounter new obstacles as the pandemic progresses, such as chronic sequelae and persistent symptoms associated with Long COVID. This particular disease will open a new window in biological research, posing a number of questions that must be answered.

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