

Preface

Cardiovascular Effects of COVID-19



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The COVID-19 pandemic has had a dramatic impact on the care of patients with cardiovascular disease throughout the world. COVID-19 has a myriad of direct effects on the myocardium, vasculature, and coagulation cascade, related to the proinflammatory and prothrombotic effects of the virus, leading to an increased risk of myocardial infarction, stroke, deep venous thrombosis, and pulmonary emboli within the first 2 to 4 weeks of contracting the disease (**Fig. 1**).^{1–4}

Patients with heart failure constitute a subgroup of patients at high risk of complications from COVID-19.^{5,6} Preexisting heart failure is associated with increased mortality in patients hospitalized with COVID-19. Worsening functional heart failure class has been associated with increased duration of hospitalization and escalation of therapies leading to increased mortality.^{5,6} Similarly, 3% to 25% of patients developed left-ventricular dysfunction after admission from COVID-19. The overall mortality for hospitalized heart failure patients with COVID-19 was between 4% and 40%. Possible mechanisms of COVID-19 and heart failure include effects of proinflammatory cytokine storm in patients with COVID-19 affecting the myocardium, direct myocardial injury, such as myocarditis, coronary thrombosis, late

presentations of acute myocardial infarction, and acute respiratory failure leading to myocardial supply, demand mismatch leading to oxidative stress and damage to the cardiomyocytes. The role of mRNA vaccines, as potential triggers of myocarditis, is also an important consideration, particularly in young men.

The indirect effects of the pandemic in terms of disruption of health care processes and pathways of care have been as dramatic.^{2,7–9} Public health measures designed to mitigate the spread of the virus, such as lockdowns, cancellation or deferral of elective procedures, in person appointments, and restrictive visitation policies, resulted in patients' reluctance to obtain both elective and emergent medical care. This resulted in a reduction in the number of patients with ST-segment elevation myocardial infarction (STEMI) presenting to hospitals throughout the world and significant delays in those who did arrive.⁹ This led to a dramatic increase in mortality for patients with non-STEMI and STEMI with a higher rate of out-of-hospital cardiac arrest, cardiogenic shock, and late complications of acute myocardial infarction, including heart failure.⁸ These deleterious effects on cardiovascular outcomes have been documented in patients with and without COVID. In

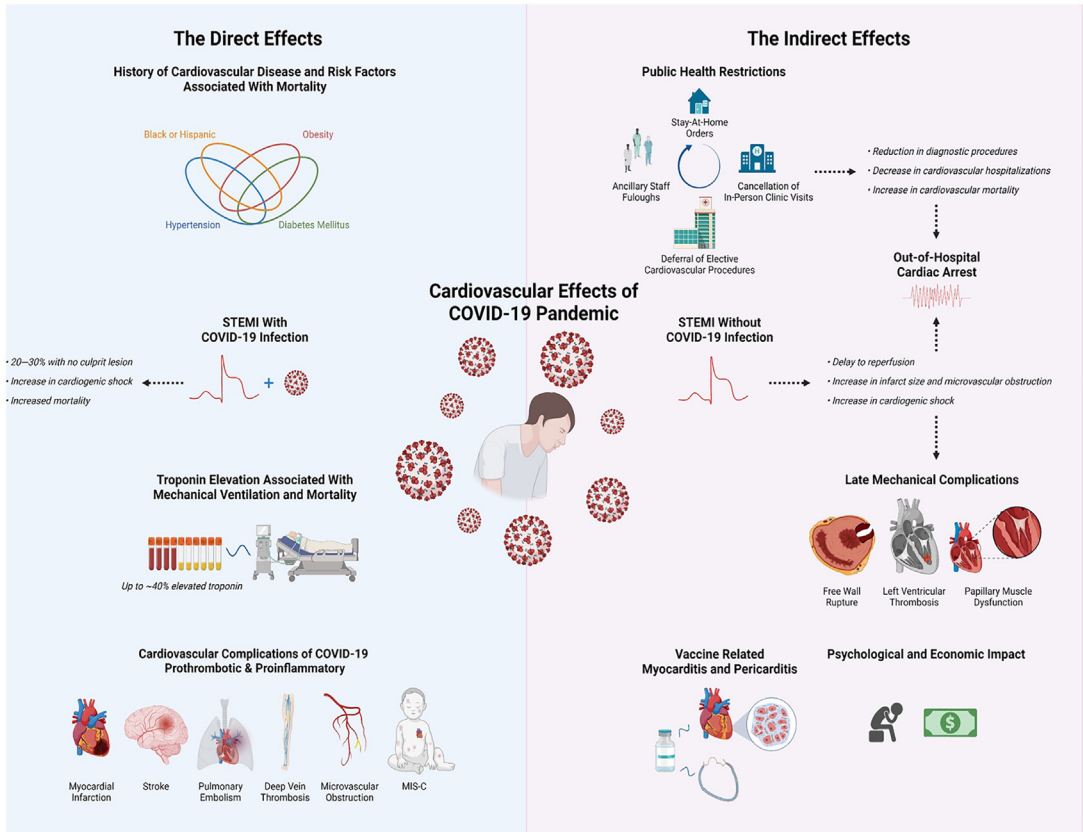


Fig. 1. The direct and indirect effects of COVID-19 on cardiovascular disease. (From Henry TD, Kereiakes DJ. The direct and indirect effects of the COVID-19 pandemic on cardiovascular disease throughout the world. *Eur Heart J*. 2022 Mar 14;43(11):1154-1156. <https://doi.org/10.1093/eurheartj/ehab782>. PMID: 34791131; PMCID: PMC8690059.)

addition, there have been significant economic and psychologic impacts on patients throughout the world.

We believe this outstanding collection of articles regarding both the direct and the indirect effects of the COVID-19 pandemic will help us to improve the care of cardiovascular patients.

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