

Does the presence of cardiovascular risk factors or established cardiovascular disease affect the survival of patients with COVID-19?

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Undoubtedly, COVID-19 has been one of the most dreadful threats to public health globally in recent times. Numerous studies have been conducted to explore the epidemiology, pathophysiology, outcomes, management, and prevention of COVID-19 complications. Now, when the acute phase of the pandemic seems to be over, it is essential to evaluate the clinical status of the patients who have survived the disease. Cardiovascular (CV) risk factors are closely associated with the severity of COVID-19, including its morbidity and mortality.¹ Hypertension, diabetes, and ischemic heart disease have been noted to be the most prevalent CV conditions in COVID-19 nonsurvivors.¹ The CV system involvement has been shown to be extensive in COVID-19-affected patients.² Different studies aimed to evaluate the CV effects of COVID-19. Most of them focused on the risk stratification, prognosis, and mortality of COVID-19.^{2,3} Now, it is time to focus on the assessment of the short- and long-term survival of patients with COVID-19. Determining the correlation of CV risk factors and established CV disease (CVD) with COVID-19 and evaluating their effect on survival will help health care providers deliver better long-term care for such patients. It will also help identify the high-risk groups and prevent further morbidity and mortality.

In the Cor-Cardio study, Ostrowska et al⁴ evaluated 2346 patients hospitalized for COVID-19 between March and October 2020. A total of 341 patients died during the hospitalization, and 95 died during the follow-up (median follow-up, 213 days). A lower prevalence of established CVD (eg, heart failure [HF]), as well as of chronic kidney disease (CKD) and a history of cancer was found in the patients who survived the disease than in those who did not. Similar findings were reported in other studies from the United States, Brazil, and Italy, where HF, CKD, and

cancer were associated with increased mortality in COVID-19 patients.⁵⁻⁷ Interestingly, in the Cor-Cardio study,⁴ the prevalence of CV risk factors without established CVD was higher in the survivors than in those who died during the hospitalization. There was no difference in the prevalence of CV risk factors, established CVD, and other concomitant diseases in the patients who died during the hospitalization, as compared with those who died during the follow-up. Lower blood pressure, greater prevalence of tachycardia, higher plasma glucose concentration, lower oxygen saturation, and more frequent need for mechanical ventilation were noted in the patients who died than in those who survived the hospitalization.⁴ A study from Switzerland⁸ showed that hypertension and obesity were not associated with mortality in COVID-19 patients. However, hypertension appeared to decrease survival when combined with other CVDs.

Ostrowska et al⁴ found that the patients who died during the follow-up had a more extended hospital stay and more frequently required mechanical ventilation than those who remained alive at the end of the follow-up. The use of angiotensin-converting enzyme inhibitors/angiotensin II receptor blockers (ACEIs/ARBs) or mineralocorticoid receptor antagonists (MRAs) was noted to be associated with a lower risk of in-hospital death. The use of other CV drugs, including β -blockers, MRAs, and aspirin, did not have any protective role in preventing mortality after discharge.⁴ Various studies have supported the findings of lower levels of inflammatory markers and lower in-hospital mortality in patients with COVID-19 using ACEIs/ARBs.⁹ A recently published analysis of 898 303 eligible patients with COVID-19-related hospitalization has shown a protective effect of MRAs on the risk for mechanical ventilation and mortality.¹⁰

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Received: May 2, 2023.

Accepted: May 4, 2023.

Published online: August 30, 2023.

Pol Arch Intern Med. 2023;

133 (7-8): 16551

doi:10.20452/pamw.16551

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Older age, a history of established CVD, HF, and CKD were independently associated with higher odds of in-hospital and post-discharge mortality in the Cor-Cardio study,⁴ whereas treatment with ACEIs/ARBs, MRAs, and statins was related to a lower risk of in-hospital death. Similar findings were reported in a study from the United States.³ This national inpatient sample study analyzed data from 1 678 995 COVID-19-related hospitalizations in 2020. The authors noted that age (adjusted odds ratio [aOR], 1.04; 95% CI, 1.04–1.04; $P < 0.001$), CKD (aOR, 1.34; 95% CI, 1.30–1.37; $P < 0.001$), and HF (aOR, 1.22; 95% CI, 1.18–1.25); $P < 0.001$) were associated with increased odds of mortality. Another study¹¹ involving 8897 patients hospitalized for COVID-19, with 3359 individuals in the statin group, showed lower in-hospital mortality and less frequent need for invasive mechanical ventilation among the patients treated with statins, supporting the beneficial effect of these drugs.

The Cor-Cardio study⁴ is undoubtedly a valuable addition to the available information on the survival of patients with COVID-19. The authors analyzed data of patients from 13 centers in Poland. They focused separately on the CV risk factors and established CVD in patients with COVID-19. It is essential to differentiate these 2 groups of patients so that individuals at a risk of CVD can be identified and managed accordingly. Though it was a retrospective study limited only to the analysis of data available from hospital systems, it added important information on COVID-19 survival during hospitalization and the 5-month follow-up. A previous Polish study by Terlecki et al¹² showed HF and diabetes to be associated with higher in-hospital mortality in patients with COVID-19. However, that study included no information on long-term follow-up.

There are still some questions to be answered. First, the Cor-Cardio study showed that the presence of CV risk factors, without established CVD, did not increase the risk of in-hospital or postdischarge death. Prospective analysis of patients with a history of COVID-19 would be vital to determine if any treatment or use of medications modifying the CV risk factors during the follow-up could influence the long-term survival of COVID-19-affected individuals. Second, this study focused only on the survival of the patients. It did not provide any information about their clinical profile, including any new CVD manifestations. There have been reports of long-term sequelae of COVID-19 involving the CV system, including pulmonary hypertension, arrhythmia, or new-onset HF.¹³ Future studies can show whether patients with a history of COVID-19 are at a risk of developing new CV risk factors or CVD during the follow-up. Third, longer follow-up of the affected patients could add more information regarding the survival and overall prognosis. Fourth, COVID-19 vaccines are now widely

available. Therefore, the effect of vaccination in the patients with a history of COVID-19 is another area to explore further.

ARTICLE INFORMATION

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CONFLICT OF INTEREST None declared.

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HOW TO CITE Hajra A, Bandyopadhyay D. Does the presence of cardiovascular risk factors or established cardiovascular disease affect the survival of patients with COVID-19? *Pol Arch Intern Med.* 2023; 133: 16551. doi:10.20452/pamw.16551

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