Long-term effects of coronavirus disease 2019 on the cardiovascular system: the CV COVID-19 registry

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Background: Patients with COVID-19 have an increased risk of cardiovascular adverse events during the acute phase. However, the long-term cardiovascular outcomes are unknown.

Objective: We aimed to determine the long-term effects of COVID-19 in the cardiovascular system.

Methods: This is a multicenter, observational, retrospective registry conducted at 17 centers in Spain and Italy. Consecutive patients older than 18 years who underwent a real-time reverse transcriptase-polymerase chain reaction (RT-PCR) for SARS-CoV2 in the participating institutions were included. Patients were classified into two groups, according to the results of the RT-PCR: COVID-19 positive or negative. The primary outcome was cardiovascular (CV) death at 1-year. The secondary outcomes included acute myocardial infarction, stroke, heart failure hospitalization, pulmonary embolism, and serious cardiac arrhythmias at 1-year. Outcomes were compared between the two groups. An independent clinical event committee adjudicated events.

Results: A total of 4427 patients were included, 3578 (80.8%) patients with COVID-19 and 849 (19.2%) without COVID-19. COVID-19 patients were older, had a higher rate of classical cardiovascular risk factors, except for active smoking, and had fewer comorbidities. At a median time of 13.5 (IQR 11.8–15.8) months, after an adjustment by baseline characteristics, there was no difference in CV death (1.4% vs. 1.1%; HR 1.03 [0.49–2.18]; p=0.941) between patients with COVID-19 and without. However, COVID-19 patients experienced higher rate of venous thromboembolism (VTE) (3.9% vs. 0.6%, HR 6.11 [2.46–15.16]; p=0.001), major bleeding (2.9% vs. 0.5%, HR 5.38 [1.95–14.84]; p=0.001), and serious cardiac arrhythmias (2.6% vs. 0.9%, HR 2.25 [1.07–4.73]; p=0.033). During follow-up, between discharge and end of follow-up, COVID-19 patients did not experience a higher risk of adverse cardiovascular outcomes (composite of CV death, any MI, ischemic stroke, systemic arterial thrombosis, VTE, heart failure hospitalization, or any serious arrhythmia) compared to patients without (HR 0.80; [0.53–1.21]; p=0.298).

Conclusions: At 1-year follow-up, COVID-19 was not associated with an increased risk of cardiovascular death but with a higher risk of VTE events, major bleeding, and serious cardiac arrhythmias. COVID-19 was not associated with a higher risk of adverse cardiovascular events during follow-up.