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SHORT EDITORIAL

COVID-19 and History of Coronary Artery Bypass Surgery

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Short Editorial referring to the article: Quality of Life Assessment of Patients Infected With COVID-19 and Prior Coronary Artery Bypass Graft Surgery in Brazil: Four Years Follow-up

In this study conducted in Brazil, a group of patients with a history of coronary artery bypass surgery with or without COVID-19 disease was analyzed to determine if their quality of life significantly changed after infection. They observed that patients with a history of COVID-19 infection had a worse quality of life during the four years of follow-up. No significant differences were found in the incidence of acute myocardial infarction, cerebral vascular events or thromboembolism, which is surprising and differs from what was expected.

On March 11, 2019, the World Health Organization declared the COVID-19 disease a pandemic. From that moment on, we believed that COVID-19 mainly affected the respiratory system and that in approximately 20% of patients, the disease was very serious with a high mortality rate. Over time we learned that COVID-19 is a multisystem inflammatory disease that is associated with cardiovascular manifestations. About half of patients hospitalized for COVID-19 have cardiovascular conditions that include coronary heart disease or a history of cerebral ischemic event, and 15-20% of them have complications like myocardial ischemia, heart failure, arrhythmias and dysautonomia.[1-3] Patients with previous cardiovascular disease may become unstable when COVID-19 occurs, mainly due to a decrease in myocardial reserve and increase in oxygen consumption and metabolic demands.

The close relationship between COVID-19 and cardiovascular diseases is more than evident. This relationship is truly bidirectional and has been shown to lead to high morbidity and mortality. In patients with coronary heart disease, viral infection through systemic inflammation mechanisms can destabilize the atherosclerosis plaque and cause rupture with the consequent appearance of an acute coronary syndrome.. In this situation, we learned to protect the patients with the use of plaque-stabilizing medications such as acetylsalicylic acid, angiotensin-converting enzyme inhibitors, beta-blockers, and statins mainly.[2-4]

When coronavirus enters the human body, the main route is the angiotensin-converting enzyme 2 through the ACE-2 receptors, which are expressed in the pulmonary alveoli, but also in the vascular endothelium at the systemic and cardiovascular level. The virus uses its S protein to enter through the ACE-2 receptors, which also causes alterations in the immune system function. Thus, evaluating the history of cardiovascular conditions and understanding the immunological behavior allows us to predict which patients will have a severe expression of the disease, with or without respiratory, cardiac, neurological or multisystem complications.[5]

According to previous reports on the association of COVID-19 with a history of coronary cardiovascular disease, these patients have a five-fold higher mortality than the average. About 35% of patients with severe COVID have high blood pressure, 17% have ischemic heart disease even with elevated serum troponin levels. The exacerbated release of cytokines of the inflammatory chain is related to an increased incidence of acute ischemic coronary syndromes. One of these cytokines is interleukin-6 (IL-6), which affects the severity of multi-system disease. In patients with the severe form of the COVID-19 disease, both molecular and cellular components of the immune system are critically altered.[1,2]

In the present study, we do not know the comorbid conditions of the patients with a history of coronary revascularization surgery. This may partly explain the absence of significant differences in the incidence

Keywords

COVID-19; Coronary Artery Bypass; Inflammation.

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of complications such as acute myocardial infarction, cerebrovascular events or thromboembolism as expected. Diseases such as type 2 diabetes, systemic hypertension and obesity can further complicate the course of viral infections by decreasing the immune response and producing acute myocardial ischemia and greater damage to ventricular function. Also, it is likely that the degree of ventricular dysfunction, the number of blood vessels grafted, among other factors influenced the results observed by the authors.[6]

References

1. Triana JFF, Márquez DAS, Silva JSC, Castro CCA, Sandoval AFB. COVID-19 and Cardiovascular Disease. Rev Colomb Cardiol. 2020;27(3):166-74. doi: 10.1016/j.rccar.2020.04.004.
2. Caulo EAR, Alcázar MC, Jiménez JMG, Aroca JMB. National Survey: Impact of COVID-19 on Cardiovascular Surgery Services in Spain (SECCE-COVID19 Study). Cir Cardiov. 2021;28(2):67–70. doi:10.1016/j.circv.2021.01.003.
3. Fernández CRS, Gamba MAA, Hernández AB. Practice of Cardiology During COVID 19 Pandemic. Recommendations of the Mexican Cardiology Community. Arch Cardiol Mex. 2020;90(1):5-6. doi:10.24875/ACM.M20000072
4. Domingo AM, Carrasco OF, Berni-Betancourt A. Potential Pro-arrhythmic Effects of Pharmacotherapy Against SARS-CoV-2. Arch Cardiol Mex. 2020;90(1):36-40. doi: 10.24875/ACM.M20000061
5. Barreiro LAD, Aranda JC, Paris JV, Ríos MO, Oseguera HG, López HA, et al. COVID-19 and the Renin, Angiotensin, Aldosterone System. A Complex Relationship. Arch Cardiol Mex. 2020;90(1):19-25. doi:10.24875/ACM.M20000063
6. Parra ÁC, Vega DN, Solis WO, Domenech JF, Aguilera SL, Pool SC, et al. Protocol for the Prevention of Ventricular Arrhythmias Due to Treatment in COVID-19 Patients. Arch Cardiol Mex. 2020;90(1):56-61. doi:10.24875/ACM.M20000070.