Cardiovascular and autonomic dysfunction in long-COVID syndrome and the potential role of non-invasive therapeutic strategies on cardiovascular outcomes

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Abstract

A significant percentage of COVID-19 survivors develop long-lasting cardiovascular sequelae linked to autonomic nervous system dysfunction, including fatigue, arrhythmias, and hypertension. This post-COVID-19 cardiovascular syndrome is one facet of “long-COVID,” generally defined as long-term health problems persisting/appearing after the typical recovery period of COVID-19. Despite the fact that this syndrome is not fully understood, it is urgent to develop strategies for diagnosing/managing long-COVID due to the immense potential for future disease burden. New diagnostic/therapeutic tools should provide health personnel with the ability to manage the consequences of long-COVID and preserve/improve patient quality of life. It has been shown that cardiovascular rehabilitation programs (CRPs) stimulate the parasympathetic nervous system, improve cardiorespiratory fitness (CRF), and reduce cardiovascular risk factors, hospitalization rates, and cognitive impairment in patients suffering from cardiovascular diseases. Given their efficacy in improving patient outcomes, CRPs may have salutary potential for the treatment of cardiovascular sequelae of long-COVID. Indeed, there are several public and private initiatives testing the potential of CRPs in treating fatigue and dysautonomia in long-COVID subjects. The application of these established rehabilitation techniques to COVID-19 cardiovascular syndrome represents a promising approach to improving functional capacity and quality of life. In this brief review, we will focus on the long-lasting cardiovascular and autonomic sequelae occurring after COVID-19 infection, as well as exploring the potential of classic and novel CRPs for managing COVID-19 cardiovascular syndrome. Finally, we expect this review will encourage health care professionals and private/public health organizations to evaluate/implement non-invasive techniques for the management of COVID-19 cardiovascular sequalae.

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Author keywords
autonomic dysfunction; autonomic impairment; cardiovascular dysfunction; cardiovascular outcomes; COVID-19; long-COVID; therapeutic strategy