



Unmasking the Silent Threat: Post-COVID-19 Cardiovascular Complications and the Road to Recovery

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The global COVID-19 pandemic has left a substantial mark on society, affecting millions of lives and triggering widespread disruption. Beyond the immediate health implications, emerging evidence suggests that recovering individuals may face long-term cardiovascular complications (1-3). As we cautiously emerge from the crisis, it is crucial to shift our focus from the acute phase to the post-COVID-19 period. This editorial aims to shed light on the importance of recognizing and addressing the cardiovascular complications associated with COVID-19 recovery, highlighting the need for enhanced medical care, research, and public awareness.

While the primary effects of COVID-19 are often associated with respiratory distress, mounting evidence indicates a significant burden of cardiovascular complications in the post-acute phase (2). Studies have shown a higher incidence of myocardial injury, arrhythmias, myocarditis, and thromboembolic events among COVID-19 survivors. In a recent milestone study, Xie *et al* (4) used national healthcare databases from the US Department of Veterans Affairs to build one the largest cohort of individuals with COVID-19 to estimate risks and 1-year burdens of cardiovascular complications of the Post-COVID-19 phase. Their results demonstrated that, aside from the first 30 days after infection, patients with COVID-19 are at increased risk of cardiovascular complications, including, dysrhythmias, ischemic and non-ischemic heart disease, myocarditis, pericarditis heart failure, and thromboembolic disease. Interestingly, these complications were evident even among those who were not hospitalized during the acute phase of the disease, suggesting the substantial risk and burden of cardiovascular complications in the post-COVID-19 phase. These results were confirmed by other studies with large sample sizes. For example, Wang *et al* study (5) on data from the US Collaborative Network in TriNetX substantiated that the post-COVID-19 phase is associated with increased risks of cerebrovascular diseases, such as stroke, arrhythmia-related disorders, inflammatory heart disease, ischemic heart disease, other cardiac disorders, such as heart failure and thromboembolic disorders. Such consequences demand attention

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as they pose long-term risks and challenges for healthcare systems worldwide.

Addressing post-COVID-19 cardiovascular complications requires a comprehensive approach involving robust medical care and ongoing research. Medical professionals should remain vigilant in monitoring recovering patients, recognizing early signs of cardiac distress, and developing tailored treatment plans (6,7). Multidisciplinary clinics specializing in post-COVID-19 care can provide crucial support, combining cardiology, pulmonology, and rehabilitation expertise to optimize patient outcomes.

Furthermore, further research is needed to understand the mechanisms behind these complications and develop evidence-based guidelines for managing post-COVID-19 cardiovascular risks (8). SARS-CoV-2 virus can cause acute cardiovascular damage, or augment the risk of chronic cardiovascular injury. Current evidence suggests that cytokine release syndrome (9,10), Renin-Angiotensin-Aldosterone System (RAAS) system dysregulation (8), plaque destabilization, and coagulation disorders (11,12) are the main pathological underlying mechanisms of cardiovascular complications of COVID-19. Longitudinal studies tracking patients over extended periods will help identify predictors of complications, establish optimal management strategies, and refine existing treatment protocols. Collaboration between healthcare providers, researchers, and policymakers

is essential to accelerate progress in this critical area and ensure the best possible care for affected individuals.

Public awareness is crucial in addressing the post-COVID-19 cardiovascular burden. Educating the general population about the potential long-term consequences of the virus is crucial for early detection and prevention. Individuals who have recovered from COVID-19 should be encouraged to prioritize regular cardiovascular check-ups, even in the absence of symptoms. Additionally, promoting healthy lifestyle choices such as regular exercise, a balanced diet, and stress management can help mitigate the risk of complications. Media campaigns, public service announcements, and community outreach programs can play a significant role in disseminating accurate information about post-COVID-19 cardiovascular complications. Collaborating with healthcare professionals, advocacy organizations, and influential figures in public health can amplify the message and ensure it reaches a wide audience.

In conclusion, as we move past the acute phase of the COVID-19 pandemic, it is crucial to acknowledge the potential long-term cardiovascular complications faced by survivors. By prioritizing medical care, research efforts, and public awareness, we can minimize the impact of these complications and safeguard the health of individuals in the post-COVID-19 era.

References

1. Elseidy SA, Awad AK, Vorla M, Fatima A, Elbadawy MA, Mandal D, et al. Cardiovascular complications in the Post-Acute COVID-19 syndrome (PACS). *Int J Cardiol Heart Vasc* 2022;40:101012.
2. Yu K, Tiffany C, David M, Victor F, Dinesh J, Marielle S-C, et al. Cardiovascular manifestations and treatment considerations in COVID-19. *Heart* 2020;106(15):1132.
3. Shrestha AB, Mehta A, Pokharel P, Mishra A, Adhikari L, Shrestha S, et al. Long COVID syndrome and cardiovascular manifestations: A systematic review and meta-analysis. *Diagnostics* 2023;13(3):491.
4. Xie Y, Xu E, Bowe B, Al-Aly Z. Long-term cardiovascular outcomes of COVID-19. *Nat Med* 2022;28(3):583-90.
5. Wang W, Wang C-Y, Wang S-I, Wei JC-C. Long-term cardiovascular outcomes in COVID-19 survivors among non-vaccinated population: A retrospective cohort study from the TriNetX US collaborative networks. *eClinicalMedicine* 2022;53.
6. Gupta S, Mitra A. Challenge of post-COVID era: management of cardiovascular complications in asymptomatic

carriers of SARS-CoV-2. *Heart Fail Rev* 2022;27(1):239-49.

7. Aiyegbusi OL, Hughes SE, Turner G, Rivera SC, McMullan C, Chandan JS, et al. Symptoms, complications and management of long COVID: a review. *J R Soc Med* 2021;114(9):428-42.

8. Petrovic V, Radenkovic D, Radenkovic G, Djordjevic V, Banach M. Pathophysiology of Cardiovascular Complications in COVID-19. *Front Physiol* 2020;11:575600.

9. Hu B, Zeng LP, Yang XL, Ge XY, Zhang W, Li B, et al. Discovery of a rich gene pool of bat SARS-related coronaviruses provides new insights into the origin of SARS coronavirus. *PLoS Pathog* 2017;13(11):e1006698.

10. Xu X, Han M, Li T, Sun W, Wang D, Fu B, et al. Effective treatment of severe COVID-19 patients with tocilizumab. *Proc Natl Acad Sci USA* 2020;117(20):10970-5.

11. Tang N, Li D, Wang X, Sun Z. Abnormal coagulation parameters are associated with poor prognosis in patients with novel coronavirus pneumonia. *J Thromb Haemost* 2020;18(4):844-7.

12. Bowles L, Platton S, Yartey N, Dave M, Lee K, Hart DP, et al. Lupus anticoagulant and abnormal coagulation tests in patients with Covid-19. *N Engl J Med* 2020;383(3):288-90.