



The Risk of COVID-19 for Patients Who Suffer from Cancer and Cardiovascular Disease

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ARTICLE INFO

Article Type:

Letter to Editor

Article History:

Received: 17 Jun 2021

Revised: 13 Dec 2021

Accepted: 22 Dec 2021

Keywords:

COVID-19

Cancer

Cardiovascular Disease

Cardio-Oncology

Dear Editor

Patients who suffer from cancer and cardiovascular disease are potentially at a high risk of acquiring Severe Acute Respiratory Syndrome Coronavirus (1) (SARS-CoV-2) and the concomitant adverse effects (2). These adverse conditions are created due to depressed immunity in patients suffering from cancer with a poor baseline physiological reserve combined with direct cardiotoxicity induced by cardiovascular disease (1). The mechanism of cardiovascular injury associated with Coronavirus Disease 2019 (COVID-19) is not completely understood. Nevertheless, it appears that Angiotensin-Converting Enzyme-2 (ACE-2) plays a key role in its pathophysiology. ACE-2 is widely expressed in the lungs and the cardiovascular system with its vital role in the immune system. It is also purported to have a critical function in the cardioprotective arm of the renin-angiotensin-aldosterone pathway. Additionally, ACE-2 serves as the cellular entry point for coronaviruses including SARS-CoV and SARS-CoV-2. The higher risk of acquiring infection, showing more severe symptoms, and experiencing adverse outcomes with COVID-19 in patients with pre-existing cardiovascular

disease can be possibly explained by the higher-than-usual ACE-2 expression, but this has yet to be fully elucidated (3). Excessive cytokine production by an unbalanced immune system response via type 1 and type 2 T-helper cells as well as hypoxemia related to COVID-19-induced respiratory dysfunction can be two further causes of cardiovascular damage. The present study aims to assess the interaction between COVID-19 and two most frequent disease entities, namely cancer and cardiovascular disease.

An updated report by the World Health Organization (WHO) demonstrated a high mortality rate among COVID-19 patients with cancer. Nevertheless, the patients who were under treatment for active cancers (especially hematologic types) were more likely to be at risk for infection by SARS-CoV-2. Regrettably, our records revealed a significant drop (approximately 40 – 60%) in the number of cancer patients (inpatients and outpatients) who needed follow-up and treatment in our cardio-oncology department (Rajaie Cardiovascular Research Center). This decline could be attributed to the patients' fear of contamination with the coronavirus in hospitals or the exhaustion of the entire health system resources by patients with COVID-19. On the other hand, manifestation of critical cardiovascular complications such as dyspnea and pulmonary edema in these patients could be mistaken with the coronavirus features, resulting in their management as COVID-19

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cases. Therefore, these patients might expire at home in the worst scenario due to the wasted time interval between the symptoms onset and the first medical contact.

Physicians, medical staff, and social media are recommended to inform cancer patients about the symptoms of the major cardiovascular complications of cancer, chemotherapy, and radiotherapy such as tamponade, myocardial infarction, pulmonary edema, pulmonary thromboembolism, hypertension crisis, and severe left ventricular dysfunction. The vital importance of timely referral to designated centers and clinics has been underscored, as well. Moreover, patients suffering from cancer, particularly those exhibiting cardiotoxicity (cardio-oncology patients), who are suspected for COVID-19 should be isolated and screened via laboratory and imaging tests, and the medical staff should fully make use of personal protective equipment (4, 5).

Acknowledgements

There is no acknowledgement.

Authors' Contribution

Study concept and design: A.A. and M.P.; analysis and interpretation of data: Z.R. and A.A.; drafting of the manuscript: Z.R.; critical revision of the manuscript for

important intellectual content: A.A. and F.R.; statistical analysis: M.H.; data gathering: S.A.

Funding/Support

This study was not supported by any grants or funds.

Financial Disclosure

There is no conflict of interest.

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