



Emerging cancer in individuals with cardiovascular disease: Exploring the intersection of reverse cardio-oncology and nephropharmacology

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Reverse cardio-oncology addressed the risk of ensuing cancer in individuals with heart disease. It is imperative to collaborate oncology with cardiology to effectively prevent and treat related diseases.

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Introduction

Cardiovascular disease is now well-recognized as a micro-inflammatory condition. Recent studies detected that this disease is also responsible for immunity and metabolism dysregulation (1). This condition has been found to have straight consequences on the heart and other organs, leading to increased diseases like insulin resistance, diabetes, and myocardial infarction with increased morbidity and mortality (2). The two major diseases, cancer and cardiovascular disease are progressively detected as closely interconnected disorders, with one influencing the other. The subject of cardio-oncology has been devoted to the strengthened hazard of cardiovascular disease in individuals with malignancy (3). Conversely, several investigations propose a more complicated condition, which discusses the development of malignancy in a patient with cardiovascular disease, a condition named reverse cardio-oncology (4). This letter explains, in brief, the reverse cardio-oncology.

A short look at the cardio-oncology

It is imperative to address cardiotoxicity, which is the negative impact of cancer therapy on the heart's function

or structure. Cardiotoxicity following chemotherapy could present as heart failure, coronary artery disease, various arrhythmias, cardiomyopathy, myocarditis, and even pericarditis (5). In this context, the major concern is the risk of premature death from cardiovascular diseases in cancer patients. Adverse reactions to chemotherapy become increasingly noteworthy as cancer cases continue to rise (6). Therefore, in this field, the increasing incidence of cardiotoxicity has led to the emergence of cardio-oncology. On the other hand, the continuous launch of new chemotherapeutic agents is ongoing; however, their doubtful cardiotoxicity provokes long-term monitoring and pharmacovigilance (7). Several studies have found that chemotherapy-induced cardiovascular damage may result from direct myocardial cell injury, affecting heart structure and function (8). Otherwise, myocarditis could have occurred after infiltrating the inflammatory cells into the myocardium. Therefore, cardio-oncology is designed to assess and treat cardiotoxicity initiated by anticancer agents (9).

Reverse cardio-oncology in cancer patients

Standard cardio-oncology emphasizes cardiovascular

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complications in patients under chemotherapy. Conversely, reverse cardio-oncology addressed the risk of ensuing cancer in individuals with heart disease (10). Hence, the relationship of the two diseases indicates a crosstalk between the two illnesses. The perception of this crosstalk has crucial implications for collaborating oncology with cardiology to prevent and treat these two related diseases (11). However, the association between cancer and cardiovascular disease is not novel. Several investigations detected links between malignancy and hypertension, heart failure, atrial fibrillation, thromboembolism, atherosclerotic cardiovascular disease (e.g., myocardial infarction), and stroke, although this relationship may be incidental. Moreover, this positive association may be a publication bias. Hence, several investigations are still necessary (12,13).

Conclusion

In recent decades, chemotherapy, immunotherapy, radiotherapy, and targeted therapy have brought the possibility of survival prolongation among cancer patients. Chemotherapy-induced cardiovascular toxicity has gained attention toward increasing the survival of these patients. On the one hand, the oncologist and cardiologist must collaborate to effectively manage the adverse effects of cancer therapy on the cardiovascular system. On the other hand, the strengthened prevalence of malignancy in individuals with cardiovascular disease has spurred the establishment of reverse cardio-oncology, highlighting the collaboration among cardiologists and oncologists more than previously.

Authors' contribution

Conceptualization: Samaneh Zandifar, Sina Bakhshaei, Samin Karamian.

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Conflicts of interest

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