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Cardio-oncology as a multidisciplinary vision in approaching and treating contemporary oncological pathology

Joffre Lara Terán [1]*

1. Cardio-Oncology Service, SOLCA - Guayaquil, Ecuador.

***Correspondence:**

joffre.lara@hotmail.com

Address: Av. Pedro J. Menéndez Gilbert y Atahualpa Chávez (junto a la ciudadela Atarazana)
Apt. Postal 090505
Department of Cardio-Oncology.
Hospital de SOLCA
Guayaquil - Ecuador. Teléfono: [593] 43718300. Ext 2218.

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Abstract

Introduction: Cardiovascular diseases are the leading cause of death worldwide, and oncological diseases are increasing in prevalence. Cancer drugs can have cardiovascular side effects, and cardio-oncology is a subspecialty of cardiology concerned with preventing and treating cardiovascular complications related to cancer.

Important points from the editorial: Anthracyclines are a group of cancer drugs that can cause cardiotoxicity, which can cause various symptoms, including fatigue, dyspnea, edema, and chest pain. In severe cases, cardiotoxicity can lead to heart failure. Other cancer drugs that can cause cardiotoxicity include anti-HER2 antibodies, fluorouracil, and gemcitabine. Tyrosine kinase and endothelium-derived growth factor inhibitors can also cause cardiovascular problems, such as high blood pressure, blood clot formation, and arrhythmia. Cancer patients are also at increased risk of developing lower limb venous thromboembolic complications.

Conclusion: Early diagnosis and treatment of cancer-related cardiovascular complications are essential to improve the survival of cancer patients. Cardio-oncology is an emerging, multidisciplinary specialty that requires the participation of oncologists, hematologists, radiation oncologists, and cardiologists. The cardio-oncology team works together to assess cardiovascular risk in cancer patients, prevent cardiovascular complications, and treat cardiovascular complications that do occur.

Keywords:
DeCS: Myocarditis, Heart Failure, Integrative Oncology, Cardiology.

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Editorial

Although cardiovascular diseases continue to be the leading cause of mortality in the world, oncological diseases are increasing in prevalence, probably due to multifactorial causes. Nevertheless, one of these main factors is the fact that the population is aging. On the other hand, the management of oncological diseases has made significant advances in recent times, which has led to changes in the related morbidity and mortality curves to the point that some breast cancers are treated as chronic diseases.

There is a wide range of cancer drugs currently in use, and some of these have adverse effects related to the cardiovascular system. It has been known for some time that anthracyclines can promote cardiotoxicity. This can cause patients who relapse remission from their oncological pathologies, such as acute lymphocytic leukemia in children, to die later from cardiovascular causes. Due to the close relationship between the management of oncological pathology and the potential cardiotoxicity of these groups of drugs, a subspecialty of cardiology has been developed, which is cardio-oncology.

Cardio-oncology is a specialty with a multidisciplinary approach because it requires the coordinated work of oncologists, hematologists, radiotherapists, and cardiologists to try to stratify the cardiovascular risk of the patient who is going to receive this treatment and its subsequent follow-up to minimize and control complications.

The European Society of Cardiology, in collaboration with the European Hematology Association, the European Society for Therapeutic Radiology and Oncology, and the International Society of Cardio-oncology, presented the clinical practice guidelines for cardio-oncology in 2022. Following the policies of these guidelines, it is recommended that patients who will receive chemotherapy be stratified according to their cardiovascular risk and potential risk of developing cardiotoxicity. The same risk factors for cardiovascular diseases are the risk factors that predict cardiotoxicity from cancer therapy. Thus, patients are stratified according to whether they are hypertensive, diabetic, obese, dyslipidemic, or smokers, and they are classified as low-risk, intermediate-risk, and high-risk of developing cardiotoxicity. This will serve to plan the initial cardiology evaluation and the need to follow up with images, electrocardiograms, and biomarkers, such as troponin, to monitor the probability of having developed cardiotoxicity.

Several groups of drugs are used in oncology, and the first ones that could cause cardiotoxicity are anthracyclines. These are used in the treatment of various oncological pathologies, such as leukemia, lymphoma, and breast cancer, among the most frequent, and the possibility of developing cardiotoxicity is approximately 5% of patients. All patients who are going to receive these drugs must have a baseline cardiological evaluation. It is recommended to carry out an electrocardiogram, clinical evaluation, a two-dimensional echocardiogram, and, if possible, a three-dimensional echocardiogram to detect basal alterations in ventricular function and subsequently carry out periodic follow-ups depending on the cardiovascular risk. If clinical, electrocardiographic, echocardiographic, or biomarker abnormalities are detected, the decision must be made to start cardioprotective medication, such as converting enzyme inhibitors, beta-blockers, and statins. When the deterioration is such that the ejection fraction falls by 10% of the baseline or the global longitudinal strain by more than 15%, it is necessary to decide jointly with the team of oncologists the safety of continuing the medication or making modifications to it. Other therapeutic schemes. It is important to note that the work must be joint between the cardiology service and the other services that manage this type of patient to make the best decisions.

Other potentially cardiotoxic drugs, such as anti-HER2 antibodies, are used in patients with HER2-positive breast cancer. These patients also require cardiological follow-up. Another group of medications, such as fluorouracil and gemcitabine, are capable of causing vasospasm with angina as cardiovascular adverse effects. When this occurs, there is a need to use medications that allow these negative effects to be controlled.

Tyrosine kinase inhibitors and endothelium-derived growth factor inhibitors can cause elevations in blood pressure or thrombotic and ischemic phenomena and changes in the QT interval that can predispose to severe cardiac arrhythmias that complicate the evolution of patients, for which reason cardiological follow-up is needed. Immune checkpoint inhibitors can cause myocarditis in a low percentage of patients; however, myocarditis in these patients can have high mortality.

Another critical aspect of cardio-oncology is that cancer patients may have a higher prevalence of venous thromboembolic complications, especially patients with pancreatic and stomach cancer. It is crucial to have a high suspicion of venous thromboembolic disease as a complication of cancer since it is the second most frequent cause of death in cancer patients after disease progression. It is necessary to have a clear concept of when anticoagulant therapy is indicated. It can be started with low molecular weight heparins, and direct-acting anticoagulants can be used later.

Another function of cardio-oncology is monitoring patients with breast cancer, lung cancer, melanoma, or lymphoma who may develop pericardial involvement and pericardial effusions, which can even lead to cardiac tamponade. These patients should have periodic cardiological follow-ups with images such as echocardiography for early detection and treatment.

Unlike those previously discussed, cardiovascular complications of radiation therapy occur years after receiving this treatment and depend on the radiation dose and type of radiation. With the advent of new techniques in radiation oncology, cardiovascular complications are fewer. They can occur after several years, especially in patients with breast cancer and mainly left breast cancer, and in patients who have received chest radiotherapy for lymphoma management.

In this way, I have tried to make a quick review and outline of the importance of the baseline cardiology evaluation and cardiovascular follow-up for early detection, management, and

therapeutic modifications that should be done together with the multidisciplinary team in the follow-up of cancer patients. to reduce cardiovascular complications related to this therapy.

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Abbreviations

HER 2: Human Epidermal Growth Factor Receptor-type2.

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