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Cardio-Oncology Health Equality, Informatics and Artificial Intelligence

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Description

A multi-institutional, multidisciplinary team was put together to create a research group that will use AI and informatics to help cardio-oncology patients. Cardio-oncology is a new field of medicine that focuses on preventing, screening and treating cardiovascular side effects of cancer and cancer therapies. Cancer survivors die most often from cardiovascular disease. These patients are at greater cardiovascular risk than the general population. However, it is challenging to predict and prevent adverse cardiovascular events in people who have a history of cancer or have been treated for cancer. As a result, it was deemed crucial to establish an interdisciplinary team to develop clinical decision aids for cardiovascular risk stratification for integration into oncology patients' electronic health records.

Cardio-oncology programs, dedicated professional societies sections and committees and numerous collaborative networks have emerged to expand access to care in this new subspecialty due to its rapid emergence. However, the lack of large clinical trials to back up these recommendations limits the majority of the existing data, position statements and guidelines. In addition, proper access to cardio-oncology care and treatment poses significant obstacles, particularly for underserved and minority populations. In cardio-oncology and medicine, the emergence and development of personalized medicine, artificial intelligence (AI) and machine learning presents an opportunity for a more targeted and personalized approach to cancer treatment-related cardiovascular complications. Improved health outcomes, a more equitable approach to adequate and universal access to cardio-oncology care and the ability of health care systems to close the digital divide are all possible outcomes of the effective implementation of these new modalities [1].

The many improvements in cancer therapies have led to an increased number of survivors, which comes with a greater risk of consequent/subsequent cardiovascular disease. Identifying effective management strategies that can mitigate this risk of cardiovascular complications is vital. Therefore, developing computer-driven and personalized clinical decision aid interventions that can provide early detection of patients at risk, stratify that risk and recommend specific cardio-oncology management guidelines and expert consensus recommendations is critically important.

After cancer recurrence or the growth of new tumors, cardiovascular disease is the leading cause of death among cancer survivors. Cardio-oncology has thusly arisen as a somewhat new specialty zeroed in on counteraction and the board of cardiovascular outcomes of malignant growth treatments. Predicting individuals most at risk for cardiotoxicity, on the other hand, continues to be difficult due to issues with precision and accuracy. Screening and early diagnosis, which can improve prognosis, are also limited by obstacles like access to care. Therefore, it is essential to develop novel strategies for anticipating and early detecting cardiovascular disease in this population. We present a summary of the current state of machine learning applications in cardio-oncology in this review. We start by illustrating a few factors that ought to be considered while using AI calculations. Then, we look at studies that have used machine learning to better predict cardiac dysfunction in cancer survivors. We also talk about the potential role of wearables and the use of artificial intelligence (AI) in conjunction with the electrocardiogram (ECG) to predict cardiac dysfunction and atrial fibrillation (AF). In addition, the article provides a summary of the prospects for the future as well as key takeaways regarding the application of machine learning in cardio-oncology. The first in a series on artificial intelligence in cardio-oncology, this study adds to our earlier work on echocardiography and other imaging modalities that are relevant to cancer survivors treated in cardiology clinical practice. [2-5].

Conclusion

Cardiovascular toxicity is a leading cause of mortality among cancer survivors and has become increasingly prevalent due to improved cancer survival rates. In this review, we synthesize evidence illustrating how common cancer therapeutic agents, such as anthracyclines, human epidermal growth factors receptors, monoclonal antibodies and tyrosine kinase inhibitors have been evaluated in cardiomyocytes (CMs) derived from human-induced pluripotent stem cells to understand the underlying mechanisms of cardiovascular toxicity. We place this in the context of precision cardio-oncology, an emerging concept for personalizing the prevention and management of cardiovascular toxicities from cancer therapies, accounting for each individual patient's unique factors. We outline steps that will need to be addressed by multidisciplinary teams of cardiologists and oncologists in partnership with regulators to implement future applications in precision cardio-oncology.

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