Editorial

CARDIOTOXICITY: A MAJOR CONCERN IN CANCER THERAPY

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In recent times, the scenario of patients suffering from cancer has greatly improved owing to the evolution of cancer treatments. As a result, the number of cancer survivors has greatly increased. This achievement, however, comes with a high burden of short and long term cardiovascular (CV) toxicity. Anti-cancer therapies cause various cardiovascular toxicities which make the management of patients on long-term follow up, very challenging. Such events call for multidisciplinary care that entails skills in oncology, cardiology, and other related fields, hence the development of the cardio-oncology subspecialty. The growing number and types of anticancer drugs have added to the intrinsic complexity of the care and treatment of patients facing oncology today. Overcoming cardiotoxicity of the treatment necessitates the participation of several specialists in various disciplines such as clinical oncology, cardiology, and clinical pharmacology.[1]

Anthracyclines are widely used pharmaceutical agents, which have been noted to present certain adverse cardiovascular effects including left ventricular systolic dysfunction (LVSD) and heart failure (HF). In brief, all of the guidelines suggest emphasizing screening and optimal management of cardiovascular diseases and risk factors before, during, and after the therapy with anthracyclines. They underlie the importance of evaluating the patients for the presence of cardiotoxicity at the earliest stage possible to be able to suggest cardioprotective measures aimed at preventing the overt manifestations of LVSD and HF from developing. Nonetheless, there are numerous variations in concepts concerning the assessment and monitoring before the therapy (with the inclusion of some cardiac biomarkers such as troponin) as well as drug prevention indications in the primary prevention of cardiotoxicity.[2]

With the termination of therapy, LV dysfunction due to trastuzumab, can in many cases be restored to normalcy. Furthermore, the majority of patients can withstand the re-challenge, after heart failure was managed by the use of neurohormonal antagonists. For instance, it is possible to administer anthracyclines and trastuzumab but one of the two is given after the other, increasing the risk of cardiotoxicity significantly.[3] Statins, or, hydroxymethyl glutaryl coenzyme A reductase (HMG-CoA) inhibitors, are recognized for cardiovascular disease prevention due to their anti-inflammatory, oxidative, and cholesterol lowering properties.[4] In addition to these, statins also act through the inhibition of small Ras homologous (Rho) GTPases, due to which their function is called pleiotropic. These effects are relevant as they attenuate topoisomerase II inhibition, which is involved in the generation of reactive oxygen species. Both HMG-CoA inhibitors & Rho GTPases inhibition are thought to be pathways that contribute to the toxic cardiomyopathy associated with anthracycline and/or trastuzumab treatment. Treatment with statins may help prevent the cardiotoxic effects of these drugs.[5]

Clinical molecular biomarkers that are gaining popularity include cardiac troponins and

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natriuretic peptides (BNPs). Their applications in cardiovascular toxin evaluation, during and post cancer treatments are becoming part of recent discussions. Cardiac troponins are ideal biomarkers when determining cardiotoxicity in patients and assessment of cardiac tissue necrosis. BNP and N-terminal pro-B-type natriuretic peptides (NT-pro BNP) are often used to assess long-standing cardiovascular disorders with no obvious symptoms. However, these biomarkers are not applicable in all instances producing encouraging results. Therefore, there is a need for the exploration of novel biomarkers.[6] The emphasis of the studies has been on understanding the effects of exogenous molecular markers on the heart before or immediately after treatment to identify the patients who are likely to experience cardiotoxicity. However, cancer drugs may lead to cardiovascular effects even after remission.[7]

Provided the complex situation characterized by a constant discourse between the oncological condition and cardiovascular comorbidity, the clinician needs to get sufficient knowledge to duly fulfill the requirements of the oncological case under cardiotoxic treatment. Cancer patients, who require cardiotoxicity treatment should be closely monitored for any cardiotoxic effects before it becomes clinically apparent. Echocardiography is a useful tool to assess parameters similar to LV ejection fraction (LVEF) and global longitudinal strain (GLS), ultimately to detect heart damage. Cardiac biomarkers, natriuretic peptides, and high-perceptivity (hs) troponins are gaining interest as these offer the possibility to descry cardiotoxicity in an early phase.[8]

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