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Cardiovascular Risk and Prevention Strategies in Patients with Cancer

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Abstract

Patients receiving cancer therapy are at risk of developing cancer treatment related cardiovascular toxicity (CTRCT) (e.g heart failure, hypertension). A broad spectrum of cardiovascular toxicities have emerged depending on the class of cancer drug delivered (e.g anthracyclines – heart failure; immune checkpoint inhibitors – myocarditis). However, when determining an individual's risk of cardiovascular toxicity there are several factors which should be considered beyond the cancer drug administered. In 2020 the Cardio-Oncology Study Group of the Heart Failure Association of the European Society of Cardiology (ESC) published a baseline cardiovascular risk assessment in cancer patients scheduled to receive potentially cardiotoxic cancer therapy. Baseline risk evaluation includes several factors: previous cardiovascular disease; cardiovascular risk factors; lifestyle cardiovascular risk factors, previous cardiotoxic cancer treatment and cardiac biomarkers (when available). Risk factors are weighted (medium, high, very high risk) and a risk score is calculated for 9 different classes of cancer drugs. Recommendations for cardiovascular monitoring during cancer therapy is based on an individual's calculated risk. Baseline cardiology assessment to optimize management of pre-existing cardiovascular disease and modifiable cardiovascular risk factors is recommended for those patients at high or very high risk.

If patients are at high risk what strategies can be used to optimize cardiovascular health? General strategies include the ABCDE approach: increased awareness of potential cardiovascular dysfunction; blood pressure control; cholesterol control, cigarette avoidance, cardioprotective medications, diabetes control, healthy diet, and exercise. The role of cardioprotective medications has continued to evolve over the last decade. Dexrazoxane, which changes Top2's configuration and prevents anthracyclines from binding to the Top2 complex, is the only FDA approved cardioprotective agent for anthracycline induced cardiotoxicity. While this agent has been used widely in pediatric malignancies, the FDA approval is for metastatic breast cancer patients receiving > 300 mg/m2 of adriamycin. A meta-analysis of studies where dexrazoxane was evaluated for cardio-protection demonstrated a small clinical benefit, however the quality of the available evidence is low and further randomized control trials are warranted. The majority of trials have focused on neurohormonal strategies (eg ACE inhibitors/ARB's) to prevent cardiovascular toxicity. In a recent meta-analysis 17 randomized control trials (14 in breast cancer patients) demonstrated an attenuation in drop in left ventricular ejection fraction (3.96 %) however there was substantial heterogeneity and publication bias among the trials suggesting larger adequately powered randomized trials are needed to determine the efficacy and safety of these drugs. On-going studies are evaluating the role of cardioprotective medications (e.g. ACEi's, ARBs, sacubitril-valsartan; beta-blockers and statins) in this patient population. Non-pharmacological studies are examining the role of exercise as a cardio-protective strategy. While we wait for the results of these on-going studies the recently published ESC guideline in Cardio-Oncology endorses consideration of cardio-protective strategies (Class IIa recommendation) for those patients considered to be a high or very high risk of developing cardiovascular toxicity.