Feature Article

Cardiac Toxicity Related to Cancer Treatment

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Cardiac toxicity is a dose-limiting toxicity that may occur during treatment or as a late effect of therapy. Chemotherapy, radiation therapy (RT), biotherapy, and targeted therapy contribute to cardiovascular compromise that can result in cardiomyopathy, congestive heart failure (CHF), dysrhythmias, and myocardial ischemia. Advances in treatment using limited multigent chemotherapy and reduced volume of radiation treatment to the heart contribute to minimizing late cardiac toxicity. However, cardiac toxicity remains a cause of major morbidity and mortality among childhood, adolescent, and some adult cancer survivors. Data from the Childhood Cancer Survivors Study indicate that childhood and adolescent cancer survivors who lived more than five years after treatment were 8.8 times more likely to die from cardiac toxicity than doxorubicin. However, epirubicin and idarubicin, analogs similar to doxorubicin, are associated with cardiac toxicity to a lesser degree than doxorubicin.

Chemotherapy-Induced Cardiac Toxicity

Anthracyclines, alkylating agents, 5-fluorouracil (5-FU), and paclitaxel are the drugs most often associated with cardiac toxicity. These agents are associated with cardiomyopathy, CHF, dysrhythmias, and myocardial ischemia.

Anthracyclines

Anthracyclines are used to treat a variety of cancers and are the agents most widely associated with irreversible cardiomyopathy. Cardiotoxicity is thought to result from the release of free radicals during treatment that damage myocardial cells (cells of the myocardium). This does not indicate or imply endorsement by the Oncology Nursing Society.)

Doxorubicin has been the most widely studied cardiotoxic agent in adult and pediatric patients. Daunorubicin, an agent primarily used in treating acute leukemia, has a cardiotoxic risk profile similar to doxorubicin. However, epirubicin and idarubicin, analogs similar to doxorubicin, are associated with cardiac toxicity to a lesser degree than doxorubicin.

Submitted March 2003. Accepted for publication April 4, 2003. (Mention of specific products and opinions related to those products do not indicate or imply endorsement by the Clinical Journal of Oncology Nursing or the Oncology Nursing Society.)

Digital Object Identifier: 10.1188/03.CJON.557-562