Major Study Links Breast Cancer Treatment With Increased Risk of Cardiovascular Disease

Researchers urge survivors and their doctors to monitor heart health.

April 11, 2022 By Fred Hutch News Service

A new study in the Journal of Clinical Oncology shows that women receiving certain common therapies for breast cancer may be at increased risk for heart attack, stroke, heart failure, other cardiovascular events, and death.

Study authors say that even though more women are surviving breast cancer because of the increased effectiveness of treatments, the linkage of cancer therapy to increased cardiovascular events means researchers must now focus on understanding potential mechanisms and toxicities to develop clinical strategies protecting the heart health of breast cancer survivors.

“We hope to raise awareness that women who are breast cancer survivors must receive comprehensive, ongoing follow-up care and monitoring for cardiovascular risk, and scientists and clinicians must prioritize research that will reduce this risk,” said Dr. Heather Greenlee, a public health researcher at Fred Hutchinson Cancer Research Center in Seattle and lead author of the JCO article.

Greenlee and senior author Dr. Marilyn Kwan, a research scientist at the Kaiser Permanente Northern California Division of Research, led another recent study, also published in JCO, that reported an association between breast cancer treatment and the development of cardiovascular risk factors.

“This paper takes the additional step of reporting an association between treatments and the risk of cardiovascular disease itself,” Dr. Kwan said. “Cardiovascular disease, the leading cause of death among women in the U.S., is emerging as a major health concern of breast cancer survivors.”

Although researchers know that many breast cancer therapies can be toxic to heart tissue, little is known about the underlying mechanisms or other factors that may be involved – or how to address them. Most research in the field has focused on single breast cancer treatments and small samples of patients, but this study, part of the ongoing, prospective Pathways Heart Study at

KPNC, included 13,642 women with breast cancer and 68,202 women without breast cancer who were of a similar age, race, and ethnicity. The patient follow-up period was up to 14 years, with an average of seven years. The Pathways Heart Study is funded by the National Cancer Institute.

Using data from KPNC electronic health records, the researchers found that the risk of developing different types of cardiovascular disease in breast cancer survivors compared to women without breast cancer varied by the specific treatment or treatments they had received. These included commonly used chemotherapies, endocrine therapies and radiation therapy.

For chemotherapies, the researchers focused on anthracyclines, such as Adriamycin, and the monoclonal antibody trastuzumab, also known as Herceptin, because both are widely used for breast cancer treatment and are known to be toxic to the heart. Radiation therapy analyses included radiation to either side of the body, with special attention paid to radiation on the left side, which has been associated with increased risk of heart disease. Endocrine therapy was grouped by those receiving aromatase inhibitors versus those receiving tamoxifen because the two therapies work differently to reduce the cancer-promoting effects of estrogen and have different effects on the cardiovascular system.

Among findings:

- Women who received anthracyclines and/or trastuzumab had high risk of heart failure or cardiomyopathy, compared to women without a history of breast cancer. The highest risk was seen in women receiving both drugs.
- High risk of heart failure or cardiomyopathy was also seen in women who had received radiation therapy and aromatase inhibitor therapy, relative to women without a history of breast cancer.
- Although degree of risk varied with different forms of treatment, the researchers found that women undergoing breast cancer treatments had elevated risks for stroke, arrhythmia, cardiac arrest, venous thromboembolic disease (blood clots in deep veins), cardiovascular disease-related death, and death from any cause compared to women without a history of breast cancer.

Although this analysis did not investigate treatment combinations across different therapy types, doses or durations, the researchers plan to address these specifics in future studies.

“There are more than 3.8 million women survivors of breast cancer now living in the U.S., and that number is growing rapidly. But while improvements in treatments are extending the lives of breast cancer patients, survivors are facing new risks from heart disease. Although this study represents a significant step in helping us recognize the effects of cancer treatments on cardiovascular health, much more work lies ahead in understanding the mechanisms leading to disease and

developing new strategies to protect our patients," said Dr. Jennifer Specht, a breast cancer specialist who treats patients at Seattle Cancer Care Alliance.

This story was published by Fred Hutch News Service. It is republished with permission.
