# Calculating the Risk of Heart Failure for a Common Leukemia Treatment

Researchers designed a calculator to predict who among those receiving treatment for two forms of acute leukemia are at highest risk.

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Patients treated with the anthracycline class of chemotherapy for acute lymphoblastic leukemia (ALL) or acute myeloid leukemia (AML) are at increased risk of heart failure. This risk is highest during the first year following treatment.

Originally developed as antibiotics, anthracyclines, are a longtime standard form of treatment for acute leukemia. They are given at a high dose during a very short period, thus increasing toxicity, including to the heart cells.

Researchers at Penn Medicine at the University of Pennsylvania designed a risk calculator to predict an individual's risk of heart failure following anthracycline treatment for ALL or AML.

The idea is to use that prediction in designing treatment strategies. They published their model in a new paper in JACC: CardioOncology.

The study's corresponding author, Marielle Scherrer-Crosbie, MD, PhD, director of the cardiac ultrasound laboratory and a professor of cardiovascular medicine at Penn, said in a press release, "Our hope, in creating this risk score system, is to help clinicians identify patients with the highest risk for potential cardiac damage, so they can more closely monitor the patients via a multidisciplinary approach."

The authors of the new paper analyzed data from 450 people with ALL or AML. Forty (9%) of the participants developed symptomatic heat failure, doing so an average of 10 months following exposure to anthracycline treatment.

Those with AML had a higher rate of heart failure than those with ALL.

Next, the investigators created a risk score, ranging from 0 to 21, based on factors associated with strain to the heart muscles, including ejection fraction, preexisting heart disease, being older than 60 and having a cumulative treatment dose of anthracycline of at least 250 milligrams per meter of height. Three hundred eighteen of the participants were considered to be at low risk of heart

failure (0 to 6 points), while 12 were considered to be at moderate risk (7 to 13 points) and 20 were classified as being at high risk (14 to 21 points). Sixty-five percent of those considered high risk developed heart failure, compared with just 1% of those considered low risk.

“While this is a significant step toward identifying patient risk for heart failure, additional studies are needed to determine the effectiveness of such a risk score in clinical practice,” said the study’s lead author Yu Kang, MD, PhD, a postdoctoral research fellow at Penn.

New cases of acute leukemia have been rising in the United States for a decade, even as treatments have improved. Mortality rates declined by 1% per year between 2006 and 2015.

To read a press release about the study, click here.

To read the study, click here.

To read more about cancer and the heart, click here and here.

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