

Bone marrow stem cells improve heart function, study finds

March 26 2012

A research network led by a Mayo Clinic physician found that stem cells derived from heart failure patients' own bone marrow and injected into their hearts improved the function of the left ventricle, the heart's pumping chamber. Researchers also found that certain types of the stem cells were associated with the largest improvement and warrant further study.

The results were presented today at the 2012 American College of Cardiology Meeting in Chicago. They will also be published online in the [Journal of the American Medical Association](#).

This Phase II clinical trial, designed to test this strategy to improve cardiac function, is an extension of earlier efforts in Brazil in which a smaller number of patients received fewer stem cells. For this new network study, 92 patients received a placebo or 100 million stem cells derived from the bone marrow in their hips in a one-time injection. This was the first study in humans to deliver that many bone marrow stem cells.

"We found that the [bone marrow cells](#) did not have a significant impact on the original end points that we chose, which involved reversibility of a lack of blood supply to the heart, the volume of the [left ventricle](#) of the heart at the end of a contraction, and [maximal oxygen consumption](#) derived through a [treadmill test](#)," says Robert Simari, M.D., a cardiologist at Mayo Clinic in Rochester, Minn. He is chairman of the Cardiovascular Cell Therapy Research Network (CCTRN), the network

of five academic centers and associated satellite sites that conducted the study. The CCTRN is supported by the National Heart, Lung, and Blood Institute, which also funded the study.

"But interestingly, we did find that the very simple measure of ejection fraction was improved in the group that received the cells compared to the [placebo group](#) by 2.7 percent," Dr. Simari says. Ejection fraction is the percentage of blood pumped out of the left ventricle during each contraction.

Study [principal investigators](#) Emerson Perin, M.D., Ph.D., and James Willerson, M.D., of the Texas Heart Institute, explain that even though 2.7 percent does not seem like a large number, it is statistically significant and means an improvement in heart function for chronic [heart failure patients](#) who have no other options.

"This was a pretty sick population," Dr. Perin says. "They had already had heart attacks, undergone bypass surgery, and had stents placed. However, they weren't at the level of needing a heart transplant yet. In some patients, particularly those who were younger or whose bone marrows were enriched in certain stem cell populations, had even greater improvements in their ejection fractions."

The average age of study participants was 63. The researchers found that patients younger than 62 improved more. Their [ejection fraction](#) improved by 4.7 percent. The researchers looked at the makeup of these patients' stem cells from a supply stored at a biorepository established by the CCTRN. They found these patients had more CD34+ and CD133+ type of stem cells in their mixture.

"This tells us that the approach we used to deliver the stems cells was safe," Dr. Simari says. "It also suggests new directions for the next series of clinical trials, including the type of patients, endpoints to study and

types of cells to deliver."

Provided by Mayo Clinic

Citation: Bone marrow stem cells improve heart function, study finds (2012, March 26) retrieved 24 April 2024 from

<https://medicalxpress.com/news/2012-03-bone-marrow-stem-cells-heart.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.