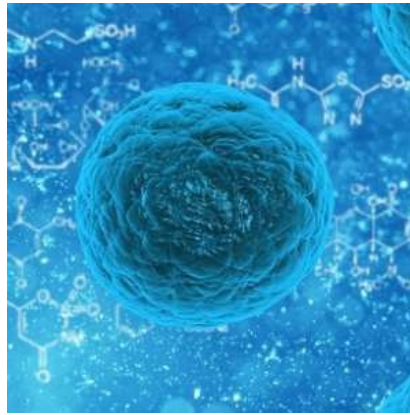




Stem Cell Delivery Method May Treat End Stage Heart Failure



A team of researchers at the University of Utah School of Medicine have tested a high dose of stem cells delivered via a method called “retrograde coronary sinus infusion” and have found that it shows promising results in patients with end stage heart failure patients. The research is published in *STEM CELLS Translational Medicine*.

The new delivery method involves giving the cells backwards (retrograde) through the heart through the main vein (the coronary sinus). The logic behind this technique is that veins do not have diseases like the arteries of the heart and thus they allow the cells to ‘marinate’ the entire heart at once as explained by lead investigator Amit N. Patel, M.D., M.S., Director of Cardiovascular Regenerative Medicine at the University of Utah School of Medicine.

Currently, there are very few treatment options for patients with advanced heart failure. These include heart transplantation or ventricular assist devices. Biological-based cell and gene therapies could thus be potentially effective treatment options for these patients as they use the body's existing repair mechanisms (mainly stem cells) to reverse or restore function in damaged organs, tissue and blood vessels.

Stem cells come from several sources such as the umbilical cord, adult fat, skin tissue and more but in cardiovascular patients, the primary source of stem cells is the patient’s own (autologous) bone marrow as it contains specialised cells that go on to become blood cells. Bone marrow is also home to mesenchymal stem cells (MSCs), which are adult stem cells that can differentiate a variety of cells types depending on the conditions of the culture they are grown in.

In this study, the researchers evaluated how retrograde bone marrow cell delivery might impact patients with either ischaemic or non-ischaemic heart failure.

Dr. Patel explained, “Methods such as direct injection during open heart surgery or via catheter have shown some success, but the problem is that with these methods you can only safely deliver a limited number of cells and they don’t always migrate to the areas that need repair. This makes the translation from pre-clinical models to human dosing more challenging.”

He further explains that retrograde delivery into the coronary sinus by infusion can provide doctors the ability to deliver large numbers of stem cells directly to the impacted areas with minimal side effects. The coronary sinus is accessed via the right femoral vein using a balloon infusion catheter.

Since the method has not yet been tested on patients suffering from advanced heart failure, this clinical trial was conducted to determine whether a large dose of nucleated bone marrow cells infused into the coronary sinus of heart failure patients proves to be effective. 60 patients were included in the study and were divided into two test groups based on their ischaemic or non-ischaemic cardiac incident. 24 patients in each group were given

the bone marrow infusions (the BMAC groups), while the other six patients in each comprised the control group and received standard heart failure care. Patients were followed-up at one, three, six and 12 months.

“At the end of the trial, our tests revealed that all patients receiving the bone marrow infusions had improved

heart function, with no adverse side effects, especially those in the non-ischemic group,” Dr. Patel reported. “As a result, we believe that this study provides the basis for a larger clinical trial in advanced heart failure patients.”

The results of this study are promising and require further investigation.

Source: [Stem Cells Translational Medicine](#)

Image Credit:

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