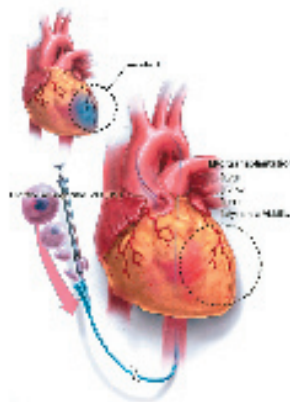


Cell Therapy for Ischemic Heart Disease

An Overview

Chaophya Hospital, in collaboration with a leading biotechnology firm, TheraVita, is now offering state-of-the-art cell therapy for end-stage ischemic heart patients for the first time in Asia. Using autologous cell therapy, circulating adult stem cells harvested from the patient's own blood, the cells are separated from other blood cells and greatly expanded in number in the laboratory using GMP manufacturing standards.

Approximately one week later these cells, called angiogenic progenitor cells or APC's for short, are re-infused back into the blood vessels supplying blood flow to the heart muscle. The injected cells migrate out of the blood vessel's lumen and take hold in the ischemic muscle region where they stimulate the formation of new blood vessels to bring more blood flow to the needy heart muscle fibers.



In addition to being precursor cells for blood vessels, some of the APC's are known to also morph into cardiac muscle cells, fuse with heart muscle fibers and secrete cytokines, molecules that provide the homing signals to recruit other cells and molecules to help rejuvenate the function of heart muscle. In this case, the APC's transfused are expected to turn into or stimulate the formation of new blood vessels.

Benefits of autologous adult stem cell therapy are numerous:

- "Autologous" stem cell therapy means the adult stem cells used for treatment are taken from the patient's own blood so there is no danger of the patient's body rejecting them.
- Risks of infection are lowered because the genetically identical cells contain no infectious agents beyond what the patient already harbors could be introduced.

- The cell collection is nearly painless and is identical to a blood donation; thus no need for immunosuppressive drugs or administration of anesthesia.
- Using adult stem cells completely sidesteps the thorny ethical issues associated with use of embryonic stem cells.
- Administration of the APC's is quite safe: the risks involved are similar to those of the standard balloon angioplasty procedure that is routinely performed daily the world over.

The entire procedure takes approximately 14 days, depending upon the patient's physical condition. The beneficial effect becomes clinically discernable usually after one month and becomes maximal at 3-6 months.

While the treatment may not cure heart disease, it can substantially improve the flow of blood in a large majority of the patients treated, thus reducing chest pains and sharply increasing physical capacity. The result for many patients is an improvement in quality of life to the point where many activities enjoyed before their illness have once again become possible and enjoyable.

Cell Therapy Treatment History

Worldwide over the past decade, more than 200 heart patients have received cell therapy in one form or another, mostly in Europe. Because of regulatory requirements, the U.S. lags behind in this area. Three trials have received FDA approval and are currently underway in the U.S. at the University of Pittsburgh in Pittsburgh, St. Elizabeth Medical Center in Boston and Texas Heart Institute in Houston, with more trials expected in the coming months.

The first patient treated at Chaophya Hospital was featured in the November 21, 2005 issue of Time magazine, and to-date more than eighty patients from North America, Europe, the Middle East, and Southeast Asia have been successfully treated.