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Stem cell process spares 5 transplant patients from anti-rejection drugs

Five people who received kidney transplants in a study are now living without anti-rejection medicines, thanks to stem cells from their organ donors, according to research published Wednesday.

Dr. Suzanne T. Ildstad, a University of Louisville scientist, and her colleagues locally and at Northwestern University in Chicago published the findings in the Science Translational Medicine journal.

They said they hope the procedure someday changes the lives of thousands of organ recipients, who now must take anti-rejection medicines for the rest of their lives, risking side effects such as infection, cancer, high blood pressure and kidney damage.

"Being a transplant recipient is not easy," said Ildstad, director of the Institute of Cellular Therapeutics at U of L. "This new approach would potentially offer a better quality of life and fewer health risks."

The experimental procedure uses specially processed stem cells from kidney donors to give recipients a combined immune system that lets their bodies recognize the donated organs as their own.

The process begins about a month before the transplant, when bone marrow stem cells are collected from the blood of the kidney donor. The donor cells are sent to U of L to be processed to bring out "facilitating cells" that researchers think help transplants succeed. Doctors transplant the donor stem cells one day after the kidney transplants, which take place at Northwestern.

The journal article looked at the first eight of 15 patients to undergo the procedure — the ones with long-term results. Five of the eight were successfully weaned off all anti-rejection medicines a year after transplant.

One was Robert Waddell of Louisville, a 45-year-old global treasury manager at Brown-Forman Corp., who used to suffer from polycystic kidney disease, in which multiple cysts form on the kidneys, causing them to become enlarged. Waddell got a new kidney in May 2009 from Hugh Haydon, a friend. Four of the eight study subjects in the journal article got kidneys and stem cells from unrelated donors.

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Before the transplant, Waddell underwent pre-transplant conditioning, which included chemotherapy and radiation. Haydon had his bone-marrow stem cells harvested at Northwestern after receiving a treatment to get the stem cells circulating in his blood.

After the transplant, doctors gave Waddell anti-rejection medicines, but then tapered them from two to one as of early 2010. They later tapered the remaining drug to a very low dose and stopped it in July 2010.

Waddell said he's doing "fantastic," even running and working out with weights regularly.

But not every patient has had such positive results.

According to the journal article, two of the study subjects achieved "transient chimerism," or a blended donor-recipient immune system for a while, but now require immunosuppression with a low dose of a drug called tacrolimus. A third study subject eventually developed an illness that progressed to sepsis, and doctors had to remove the donated kidney. He subsequently had another transplant from a related donor and is doing well on standard immunosuppression.

"The beginning was a learning curve," Ildstad said.

Ildstad acknowledged that one kidney recipient died in a previous study in Louisville, but said an extensive analysis found that it was not the stem cell product that caused the death, and there was no definitive cause identified.

Ildstad said in the current study, the majority of patients are doing well without anti-rejection medicines.

Dr. Joseph Leventhal, transplant surgeon at Northwestern Memorial Hospital, said while the results from the ongoing study are preliminary, they "are exciting and may have a major impact on organ transplantation in the future."