MedicalXpress

New procedure could improve success rate of cell transplant to cure type 1 diabetes

April 4 2016

New research suggests pretreating cells with a peptide hormone may improve the success rate of pancreatic islet cell transplants, a procedure that holds great promise for curing Type 1 diabetes. The results will be presented Saturday, April 2, at the Endocrine Society's annual meeting, ENDO 2016, in Boston.

About 1.25 million children and adults in the United States have Type 1 diabetes. The condition occurs when the body's immune system attacks the pancreas and prevents it from making insulin, the hormone that helps the body regulate sugar in the bloodstream. The body's pancreatic islets - tiny clusters of cells that produce the hormone insulin - die off as a result. People with Type 1 diabetes need to take insulin injections multiple times a day to stay alive.

Transplanting pancreatic islet cells into an individual with Type 1 diabetes can restore the body's ability to produce insulin. However, most people who have received an islet transplant must resume taking insulin within a few years because the transplanted cells die. Researchers estimate up to half of the transplanted islet cells die off within a week of the procedure.

"We have discovered a new potential therapy that can protect transplanted human pancreatic islets from dying and, as a result, enhance the curative potential of islet transplant for Type 1 diabetes," said the study's senior author, Dawn Belt Davis, MD, PhD, of the University of Wisconsin in Madison, Wisconsin.

Davis and her colleagues treated human islets with a peptide hormone called cholecystokinin (CCK) for 24 hours. Then they transplanted about 1,000 of these human islets into mice with diabetes. The mice also were outfitted with a pump that allowed CCK to be absorbed into their bodies. For comparison, another group of mice received untreated human islet transplants and a pump that administered saline.

Preliminary results from the first four transplants showed that fewer pancreatic beta cells - the cells that produce insulin - died after treatment with CCK compared to the control group. After three weeks, 0.1 percent of the treated beta cells died, compared to 1.25 percent of the untreated cells.

After the transplant, researchers found no difference in body weight or blood glucose levels in the two groups of mice. This suggests that the findings are the result of CCK exposure rather than improvements in glycemic control.

"These results demonstrate for the first time that CCK is able to protect human islets from death under stressful conditions," Davis said. "This work has the potential to improve human islet transplant outcomes and improve the quality of life of people who have Type 1 diabetes."

Provided by The Endocrine Society

Citation: New procedure could improve success rate of cell transplant to cure type 1 diabetes (2016, April 4) retrieved 18 April 2024 from https://medicalxpress.com/news/2016-04-procedure-success-cell-transplant-diabetes.html