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The importance of adequate timing in creation of an artificial subcutaneous site for pancreatic islet transplantation

Jan Kriz
Institute for Clinical and Experimental Medicine, Czech Republic

The pancreatic islet transplantation represents a real treatment for type-1 diabetic patients suffering from hypoglycemia unawareness syndrome. The wider application of this method is limited among others by a suboptimal efficiency of islet engraftment. In clinical practice, islets are commonly infused into the hepatic portal vein, where they spontaneously settle in terminal branches. Immediately after infusion, they induce the Instant Blood Mediated Inflammatory Reaction (IBMIR), which results in considerable destruction of graft cells and subsequent non-optimal long term function. The better site for islet transplantation should predominantly provide the adequate oxygen supply without a direct contact to the recipient blood, and should be created using a minimally invasive surgery without any signs of inflammation in time of transplantation. Therefore, the most groups prefer a long term (at least four weeks) creation of subcutaneous cavities with completely finished healing process in time of islet administration. Practically, they transplant islet into the almost avascular fibrous tissue. The main goal of this study is the identification of optimal timing of islet transplantation after the insertion of polymeric macroporous scaffold under skin. We intend to detect the vascular density, blood perfusion and intensity of inflammation during individual phases of tissue healing in the close vicinity of inserted scaffolds. Using a marginal mass of islets transplanted in optimal time, we demonstrate the superior metabolic control in diabetic Lewis rats.

Biography

Jan Kriz has completed his PhD from the Charles University in Prague, Czech Republic and Post-doctoral studies from the University of Western Ontario in London, Ontario, Canada. He is the Principal Investigator of projects focused on "improvement of pancreatic islet transplantation efficiency in the IKEM", at leading transplant center in the Czech Republic and one of the four most active centers in transplantation of insulin producing tissue. He has published more than 30 papers in reputed journals.

jkri@medicon.cz

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