

Endoscopic Gastric SubMucosa (eGSM-ITx) Islets transplantation in pigs with streptozotocine induced diabetes.

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Body: Islets transplantation have become standard treatments of patients with diabetic complications but long-term results are still unsatisfactory. Gastric submucosa might be an alternative site for transplantation. **The aim** of this study was to assess the possibility of endoscopic islets transplantation into the gastric submucosa. **Materials and methods:** 20 Landrace pigs weighing 19-24kg were obtained for the study. 7 were controls (C-group) and 13 were Transplantation group (TX group). In both groups diabetes was induced by streptozotocine (stz) infusion at 200 mg/kg. At 7 days post stz infusion pigs underwent endoscopy. Immunosuppression consisted of tacrolimus, sirolimus. At 7 days post transplantation, control gastroscopy was performed to assess the gastric mucosa and to take biopsies for histopathology. 10 to 30 days after eGSM-ITx Magnetic Resonance (MRI) examination was performed. Stomach and pancreas were obtained at autopsy for histopathology. For 10 days after diabetes induction (up to three days after eGSM-ITx) in both groups, insulin was given to reach glycemia between 150-200mg/dl, after that period insulin was given only when glycemia exceeded 600 mg/dl. **Results:** There were no differences in insulin requirement and glycemia up to the day of eGSM-ITx between the groups. Tx-group received a mean of 6000 IEQ/kg. Mean glycemia in the day of Tx was 445 in C-group and 470 in Tx group (p=NS). At 1, 3, 7, 21 and 30 days post-transplantation glycemia in C-group was: 452, 555, 600, 586, 573 vs. 215, 278, 220, 213, 123 in Tx-group (p<0.05). Tx-group animals had a significantly lower insulin requirement and significantly lower mean glycemia since the first day post transplantation. This trend was observed till the end of study at 1 month. There were no signs of perforation, ulceration or bleeding after the eGSM-ITx on gastroscopy and histopathological examination. In MRI scans unspecific thickening of gastric wall was

observed at sites of islet deposition. Histopathology revealed insulin-producing cells in gastric submucosa in the places of injections. **Conclusion:** Endoscopic islets transplantation into gastric submucosa is feasible and a safe procedure in an experimental setting. Its potential for clinical application needs further studies.