The Digestive Week, Chicago 2020

WHAT IS A BENEFIT OF ISLET AUTOTRANSPLANTATION IN DIABETIC AND PREDIABETIC PATIENTS SUBMITTED TO TOTAL PANCREATECTOMY FOR CHRONIC PANCREATITIS WITH INTRACTABLE PAIN?

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Introduction: The potential benefits of islet autotransplantation in patients with suboptimal glucose control remains unclear. We analyzed outcomes in prediabetic and diabetic patients submitted to total pancreatectomy with islet autotransplantation (TPIAT) compared to those with optimal glucose control.

Methods: Thirty-four patients that underwent TPIAT were retrospectively divided into three groups according to the glycemic control prior to surgery: Diabetes mellitus (DM) patients (n=5, 4%) with fasting glucose > 126 mg/dL or HbA1c ≥ 6.5%; Pre-DM patients (n=11, 32%) with fasting glucose 100–125 mg/dL or HbA1c 5.7 – 6.4%; and Non-DM group (n=18, 54%).

Results: Prior to surgery, fasting c-peptide was detectible and at similar level in all 3 groups. The median islet mass isolated and transplanted, expressed in islet equivalents (IEQ), in the DM group was 191,800 (2,500- 257,500), comparable to the Pre-DM and Non-DM groups: 111,800 (30,000-322,000; p=0.32), and 232,000 (67,000-379,000; p=0.6), respectively. However, islet mass in Pre-DM was significantly lower than in the Non-DM group (p=0.03) (Fig 1). This trend was also significant when comparing islet mass in IEQ per patient body weight (IEQ/kg): the median islet mass in the Non-DM was 3,400 IEQ/kg (680 –5,190), significantly higher compared to the DM (2,013 IEQ/kg, 34-2,700) and Pre-DM groups (1,297 IEQ/kg, 407-4,190; $p<0.05$). A similar rate of patients received clinically relevant islet mass of over 2,000 IEQ/kg in the DM and Non-DM groups: 60% (3/5) and 83% (15/18; 83.3%) (NS), respectively, but it was significantly lower in the Pre-DM (45%; 5/11) vs the Non-DM group (p=0.04) (Fig 2). Insulin independence rate at 1 year follow up was lower in the DM and Pre-DM groups (0 and 13% (1/8), respectively), compared to the Non-DM group (59% (10/17); $p<0.05$). Similarly, fasting c-peptide did not differ between DM and Pre-DM groups but it was significantly higher in the Non-DM. Nearly 80% of the patients from the Non-DM group had optimal glucose control (A1c<6.5), whereas only 37% and 25% in in the Pre-DM and DM-group, respectively (NS). Islet transplantation failed (negative c-peptide) only in one patient (3%). His BMI was 24 in contrast to BMI over 33 in remaining 4 patients in this DM group with persistent islet graft function.

Prior to surgery, all patients suffered from pancreatic pain; 60-70% required opioid therapy daily and rest only periodically (NS). Pancreatic pain gradually subsided completely in all groups.

Conclusions: Diabetic patients that still have a positive c-peptide can benefit from TPIAT, with comparable outcomes to prediabetic patients including full pain relieve and metabolic benefit of transplanted islets. Endocrine outcomes of TPIAT in diabetic and prediabetics patients are substantially worse than in those with optimal glucose control prior to the procedure.

Fig 1. Islet mass retrieved and transplanted from Diabetic, Pre-Diabetic and Non- Diabetic patients.

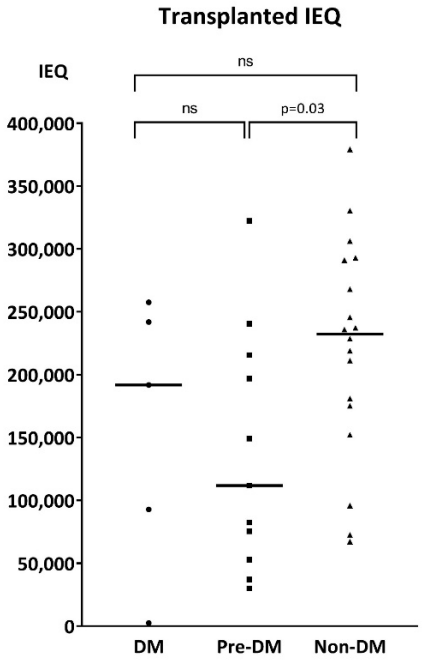
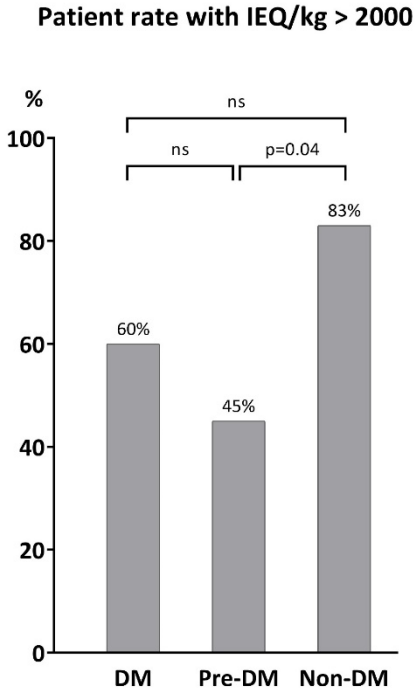


Fig 2. Rate of patients who received islet mass over 2,000 IEQ/kg.


Patient rate with IEQ/kg > 2000
%
100
80
60
40
20
0
ns
ns
p=0.04
83%
60%
45%
DM
Pre-DM
Non-DM