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Cardiovascular risk factors and intraoperative hypotension predicted development of insulin deficiency and diabetes after pancreatectomy

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Background: Ischemia in pancreatic islets is critical to β -cell function, however, clinical evidences on the implications for diabetes are lacking. Pancreatectomy can induce diabetes, but the mechanisms are not clearly elucidated. Therefore, we examined if cardiovascular disease (CVD) risk factors and intraoperative ischemia, which could cause perfusion insufficiency in pancreatic islets, are associated with insulin deficiency and diabetes after pancreatectomy.

Methods: From 2 prospective cohorts of pancreatectomy since 2007, participants were enrolled who had pre-operative HbA1c < 7% without anti-diabetics. As for proximal pancreatectomy, those were selected whose HOMA-R increased after surgery. Insulin secretion was assessed by changes in HOMA-B for 1 year (Δ B). The participants were divided into low- and high- Δ B groups, with stratification by operation type, pre-operative HbA1c, HOMA-B, HOMA-R, and Δ R. Then CVD risk factors and intraoperative ischemic events were compared between the 2 groups, and evaluated for diabetes incidence.

Results: A total of 237 patients were enrolled (men 44%, age 56 years, HbA1c 5.6% in average). Low- Δ B (median -32% of baseline) and high- Δ B (5%) groups showed comparable baseline metabolic variables. According to logistic regression analyses and Cox regression model, a composite of IGT, hypertension, dyslipidemia and a reduction in intraoperative systolic BP significantly decreased HOMA-B after 1 year (RR, 9.52; 95% CI, 1.14–79.3), and increased diabetes incidence (HR, 3.3; 95% CI, 1.2–8.9), after adjustment with age, sex, BMI, HbA1c and operation.

Conclusions: We observed that chronic ischemia suggested by CVD risk factors and intraoperative ischemic insult were linked to development of insulin deficiency and diabetes after pancreatectomy.

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