Glucose metabolism regulation in morbidly obese patients and in patients after biliopancreatic diversion

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Introduction: Morbid obesity (MO) is associated with high frequency of type 2 diabetes mellitus (T2DM). Biliopancreatic diversion (BPD) is bariatric operation that results in rapid T2DM remission and increased GLP-1 levels. The aim of the study was to compare non-diabetic MO patients with normal weight controls and with patients who underwent BPD more than 2 years ago.

Methods: Blood glucose levels, IRI, GLP-1, GIP and glucagon were measured during the oral glucose tolerance test (OGTT) in three groups of patients. Patients of the 1st group (MO) had BMI > 40 (n = 22) and no history of diabetes mellitus. Patients after BPD were included in the 2nd group (n = 23), post operative period median was 4.7 years (2.3-7.2). The 3rd group were normal weight controls (n = 22).

Results: Impaired glucose metabolism was revealed in 68.2% of MO patients (n=10). In MO group fasting glucose, IRI and HOMA-IR were maximal (p<0.001). MO patients had higher fasting and stimulated GIP and glucagon levels. In the BPD patients postprandial glucose (120 min) was lower, in 17.4% we found postprandial hypoglycemia (<2.8 mmol/l). Stimulated IRI concentration was significantly higher in the BPD group (p = 0.026). Fasting and stimulated GLP-1 were significantly higher in BPD (p= 0.037 and p=0.022 respectively).

Conclusion: Hyperglucagonemia, increased GIP levels and decreased GLP-1 levels are observed in MO. Glucose intolerance and insulin resistance incidence is higher in MO patients. Stimulated plasma IRI and GLP concentrations are significantly increased in BPD patients.

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