Summary

Insulin resistance and cholesterol metabolism in obese patients with type 1 diabetes mellitus - impact of weight reduction.

Diabetes mellitus type 1 is characterized with an absolute insulin deficiency. Deterioration of cholesterol metabolism is well known in this disease, cholesterol absorption is typically elevated. Obesity, on the other hand, is accompanied with lower insulin sensitivity, that is known to increase cholesterol synthesis and decrease cholesterol absorption. Obese type 1. diabetics thus represent, from the metabolic view, an interresting combination of absolute and relative insulin deficiency. **Aims:** The aim of this study was to characterize relation of insulin resistance and representative markers of cholesterol metabolism in obese type 1 diabetics; and to characterise their dynamics during defined weight reduction programme. **Methods:** Metabolic and antropometric parameters of obese and lean patients with diabetes mellitus type 1. were compared one time (Phase I). The dynamics of followed parameters of subgroup of obese patients was characterized during the weight reduction programme in Phase I (before intervention), Phase II (after one week of fasting + three weeks on a diet with 150g saccharides per day) and in Phase III (after one year on a diet with 225 saccharides per day). In Phase I-III, anthropometric and methabolic parameters on obese patients were characterized. Basic lipid spectrum, markers of cholesterol synthesis and absorption (squalene and non-cholesterol sterols) and omentin-1 (visceral adipokine) were measured. In Phase I-II, insulin resistance and substrate ultilisation were estimated via hyperinsulinemic euglycaemic clamp with indirect calorimetry. Data are presented as median (percentile 25%; 75%). **Results:** In Phase I significant negative correlation of glucose uptake and markers of endogenous cholesterol synthesis was found: in obese type 1. diabetics *(lathosterol P=0.021, lathosterol/cholesterol P=0.012)* as well as in lean type 1. diabetics *(lathosterol P=0.024).* In Phase I-II plasma omentin-1 was stable, however during Phase III significant elevation was found *(P<0.001).* Omentin-1 correlated with lathosterol *(P=0.033)* and campesterol/cholesterol ratio *(P=0.02).* **Conclusion:** Newly, negative correlation of markers of endogenous cholesterol synthesis with glucose uptake during hyperinzulinemic euglykemic clamp in type 1 diabetics was found. Elevation of plasmatic omentin-1 during Phase I-III, could be related to increase in insulin sensitivity. Significant negative correlation of omentin-1 and markers of endogenous cholesterol synthesis was found.