INFLUENCE OF LIFESTYLE MODIFICATION ON LEPTIN AND INSULIN RESISTANCE TO PREVENT TYPE 2 DIABETES MELLITUS DEVELOPMENT

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Abstract

The aim of our study is to assess the efficacy of a lifestyle modification including altered diet composition and physical activity in preventing diabetes mellitus type 2 (DM 2) in individuals with impaired glucose tolerance and impaired fasting glucose (IGT/IFG) and influence it on changes serum leptin levels

Materials and methods: The study included 327 patients with IGT/IFG (68 m 258 f) 25-65 years. Patients were divided into 2 groups matched by sex, age, weight, body mass index (BMI). Research group included 183 patients (32 m, 150 f) who received and carried out individual recommendations of a balanced diet and physical activity. Control group included 144 patients (36 m 108 f) who did not lifestyle modification. Related to fasting leptin (FL)concentrations by sensitive ELISA.

Results: Patients of the research group demonstrated reduction of body weight ($p<0.01$). They had positive dynamics of FPG and 2-h PG concentrations also ($p<0.001$). Persons of the control group had significant increase in weight and BMI and FPG and 2-h PG concentrations elevated ($p<0.05$). The main novel finding was that median serum leptin in research group decreased on -23.9% ($p<0.01$) and increased in control group on +27.6% ($p<0.01$) among subjects with IGT Among patients of the research group was a reduction of new care DM 2 by 11.9% and an increase in the control group by 35.1%.

CONCLUSION: Thereby, lifestyle modifications lead to reduction not only fasting plasma glucose, postprandial glucose concentrations but and fasting leptin concentrations in individuals with IGT/IFG

Objectives

While there is evidence to suggest that lifestyle changes can reduce the risk of progression of impaired glucose tolerance to diabetes type 2 there are no clinical investigation which have conclusively demonstrated that any measure can reduce leptin and insulin resistance and prevent the development of type 2 diabetes mellitus.

The aim of study

was to determine the change of fasting serum leptin and insulin levels and insulin resistance (the HOMA model) in patients with high-risk factors of DM 2 including impaired glucose tolerance/impaired fasting glucose, obese adults and first-degree relatives of patients with diabetes after lifestyle modification.

Methods

The study included 327 patients (68 men, 258 female) 25-65 years old at risk factors of DM 2 including:

1. impaired glucose tolerance and impaired fasting glucose (IGT/IFG)
2. obese adults
3. first-degree relatives of patients with diabetes.

All patients received recommendations on a balanced diet and physical activity.

The average:

- Fasting plasma glucose (FPG)
- 2-hour plasma glucose concentrations (2-h PG) following a 75-g oral glucose tolerance test
- Fasting serum leptin and fasting insulin levels were measured by immunoreactive ELISA.
- Index $HOMA-IR = [FPG (mmol/l) \times FI (\mu U/ml)]/22.5$
 $HOMA-IR \geq 2.7$ were considered as insulin resistance.

Results

Changes in clinical and metabolic parameters from baseline to 72 weeks

1. Reduction of BMI on $-2.6 \pm 0.4 \text{ kg/m}^2$ ($p<0.01$) in patients of the research group

2. Among subjects with IGT/IFG at baseline, glucose levels normalized in 56.0% of patients from the research group and 4.5% in control group

3. Serum leptin levels in research group decreased on 23.9%

Cumulative Incidence of Diabetes according to research group

Conclusions

- Previous studies have demonstrated that lifestyle modification, including balanced diet and physical activity, improves glucose tolerance status and prevents worsening of diabetes status.
- Lifestyle modifications lead to reduction not only fasting plasma glucose, 2-hour plasma glucose concentrations but and fasting leptin concentrations in individuals with impaired glucose tolerance.
- Lifestyle modifications decreased the risk for developing of DM2 by 48.0% in patients with impaired glucose tolerance.