The role of a lifestyle modification in preventing type 2 diabetes mellitus and influence it on changes serum leptin levels

T. Mokhort, E. Shishko
Endocrinology, State Medical University, Minsk, Belarus.

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) x FI (μU/ml)]/22.5
  HOMA-IR ≥ 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±0.4 kg/m² (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. HOMA-IR in research group decreased (p<0.01) and increased in control group (p<0.05)

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

Cumulative Incidence of Diabetes according to research group

Conclusions

- 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.