

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

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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.

327 patients received recommendations on a balanced diet and physical activity

Duration 72 weeks

Research group:
N= 183
patients carried out this recommendations

Control group:
N= 144
patients did not carry out this recommendations

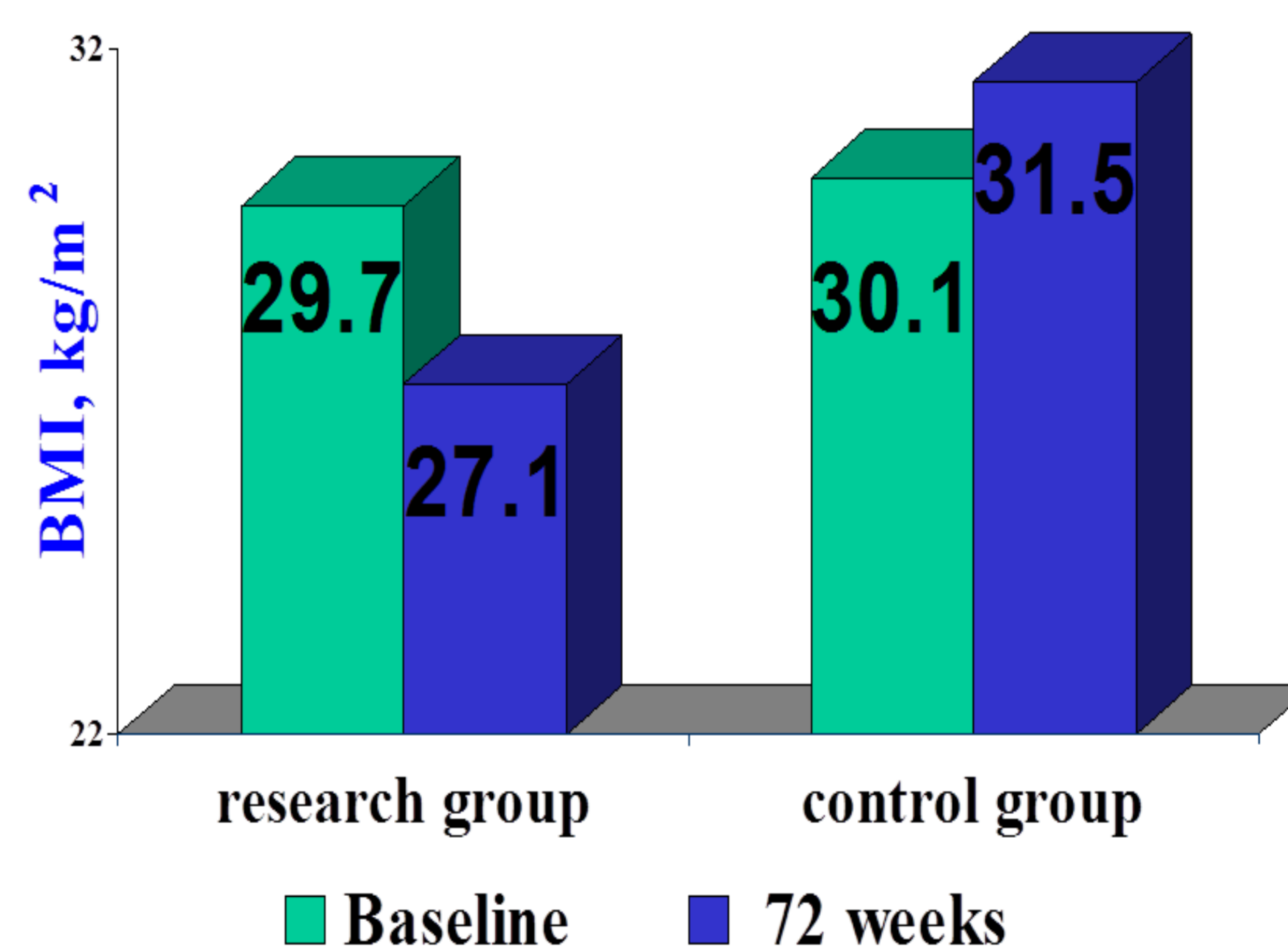
The average:

- 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.

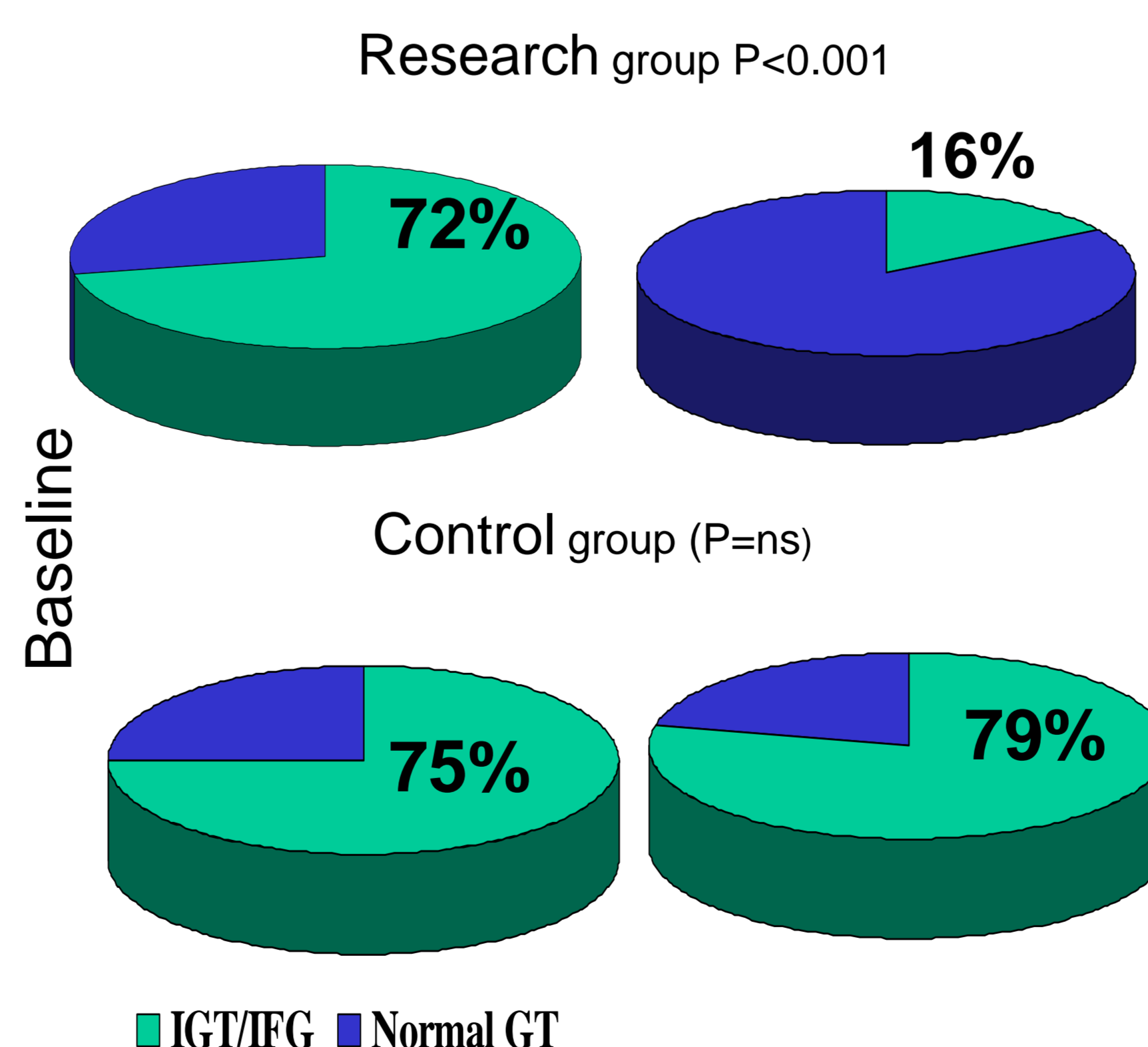
Results

Changes in clinical and metabolic parameters from baseline to 72 weeks

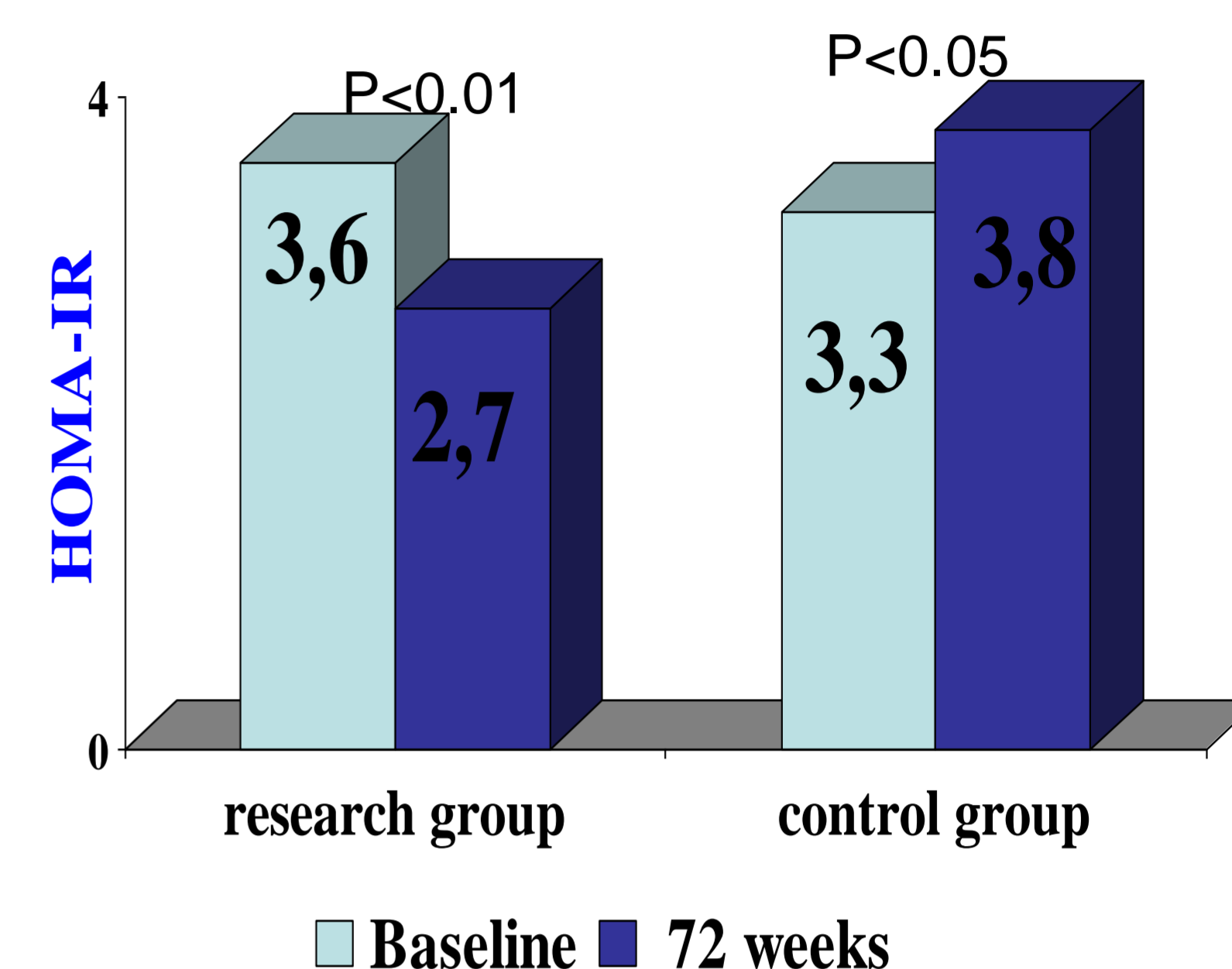
1. Reduction of BMI on $-2.6 \pm 0.4 \text{ kg/m}^2$ ($p < 0.01$) in patients of the research group



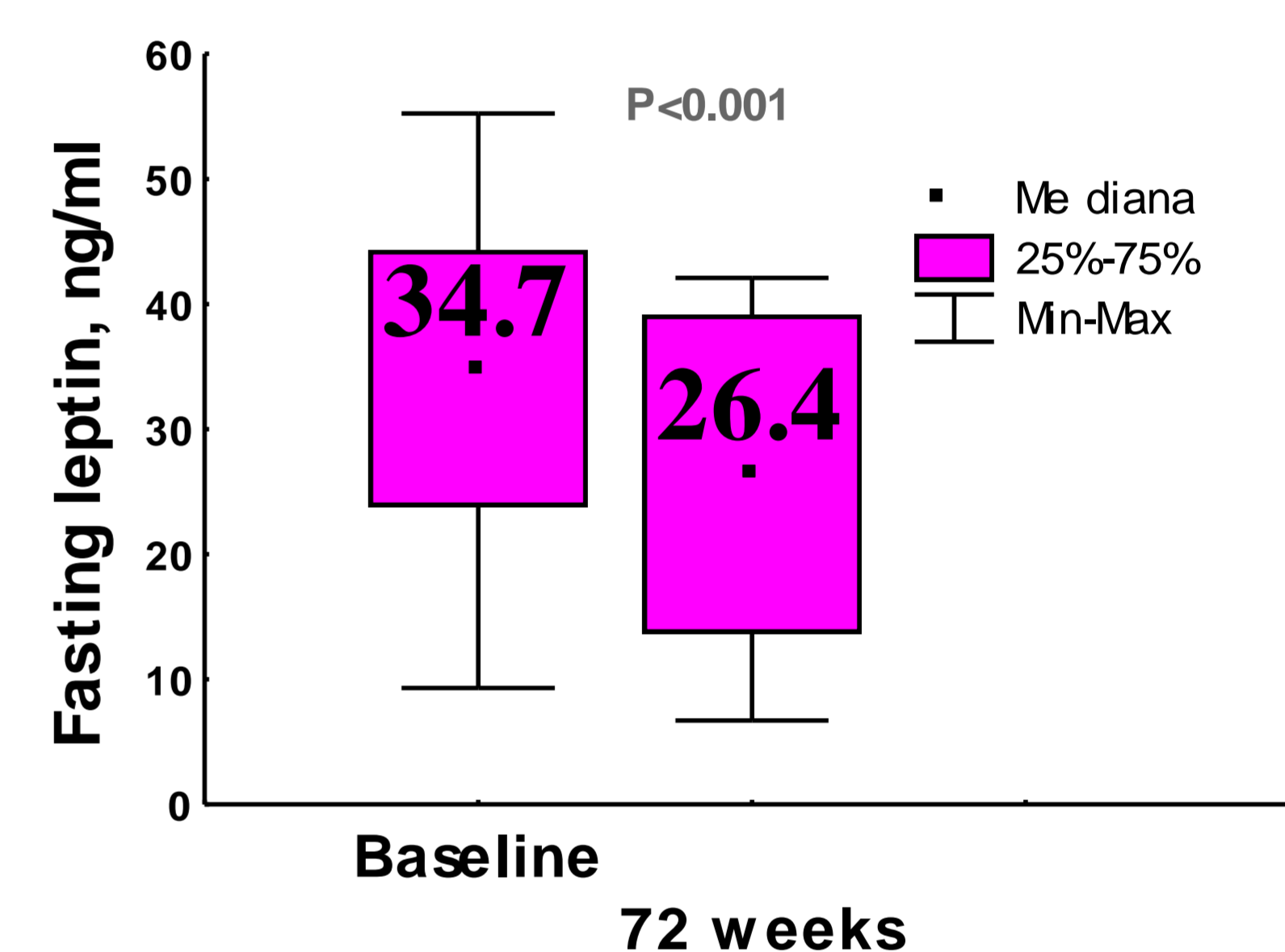
2. Among subjects with IGT/IFG at baseline, glucose levels normalized in 56.0% of patients from the research group and 4.5% in control group



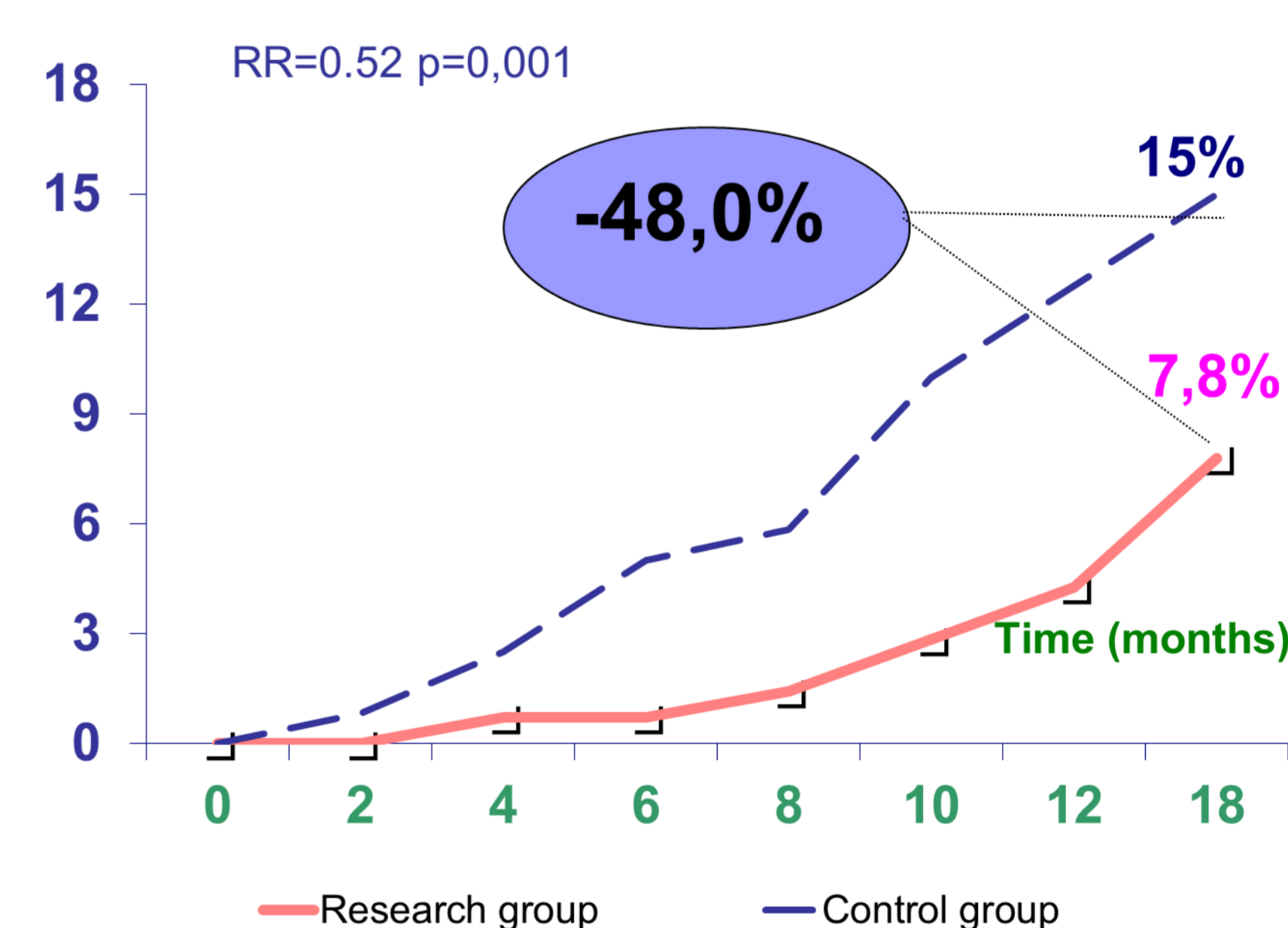
3. HOMA-IR in research group decreased ($p < 0.01$) and increased in control group ($p < 0.05$)



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.