MODERN APPROACHES TO THE DIAGNOSIS AND TREATMENT OF INSULIN RESISTANCE

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Background.

Insulin resistance is a central pathological mechanism in metabolic syndrome, type 2 diabetes mellitus, obesity, and nonalcoholic fatty liver disease. It is characterized by reduced sensitivity of peripheral tissues to insulin, leading to impaired glucose and lipid metabolism. Early detection and timely intervention are crucial to prevent metabolic and cardiovascular complications.

Objective.

To evaluate modern diagnostic methods and therapeutic strategies in patients with insulin resistance.

Materials and Methods.

A total of 80 patients with clinical and laboratory signs of metabolic syndrome were examined. Clinical assessment, biochemical blood tests, and instrumental investigations were performed. Fasting glucose, insulin levels, HOMA-IR index, lipid profile, liver transaminases, and body mass index (BMI) were analyzed. All patients received lifestyle modification therapy, dietary intervention, and insulin-sensitizing treatment for 10–12 weeks.

Results.

According to the obtained data, elevated HOMA-IR index was detected in **71.3%** of patients, indicating pronounced insulin resistance. Abdominal obesity was present in **76.0%** of cases, while overweight was observed in **18.5%**. Dyslipidemia, characterized by increased triglycerides and reduced HDL cholesterol, was identified in **62.4%** of patients. Elevated ALT and AST levels were found in **52.6%** of examined individuals, suggesting early metabolic liver involvement.

After the treatment period, a significant improvement in metabolic parameters was observed. The mean HOMA-IR index decreased from **5.4±0.8 to 3.1±0.6** ($p<0.05$). Fasting glucose levels decreased by an average of **12.8%**, while triglyceride levels decreased by **18.5%**. Body weight reduction of **4.2±1.1 kg** was achieved in patients with good adherence to lifestyle modification.

Conclusion.

Insulin resistance remains a key metabolic disorder requiring early detection and comprehensive management. Lifestyle modification combined with insulin-sensitizing therapy leads to significant improvement in carbohydrate and lipid metabolism. The study confirms the effectiveness of a multidisciplinary approach in reducing metabolic risk factors and preventing progression to type 2 diabetes mellitus.

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