

# RELATIONSHIP BETWEEN ADIPONECTIN AND ANTHROPOMETRIC PARAMETERS, INSULIN RESISTANCE AND TRANSAMINASE LEVELS IN PATIENTS WITH NONALCOHOLIC FATTY LIVER DISEASE AND TYPE 2 DIABETES



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## Background

The basis of the pathogenesis of nonalcoholic fatty liver disease (NAFLD) is insulin resistance (IR) which appears on the background of abdominal obesity (AO) which, in turn, is a key factor in the emergence of an imbalance between adipocytokines entailing a disturbance of lipid and carbohydrate metabolism, which ultimately leads to the damage of the liver cells, the development of inflammation, fibrosis and apoptosis.

NAFLD develops in 75-90% of patients with diabetes mellitus 2 type (DM2) and obesity.

DM2 may cause metabolic fatty liver disease and, like diabetes, NAFLD is now considered a manifestation of metabolic syndrome.

Metabolic syndrome is a combination of medical disorders that increase the risk of developing cardio vascular disease.

Insulin resistance is the primary pathophysiological disorder leading to DM2 and MS and is so often found in NAFLD that this form of liver disease may be regarded as similar to or a complication of 'pre-diabetes', thereby indicating the high future risk for onset of diabetes as well as cardiovascular disease.

The liver plays a central and crucial role in the regulation of carbohydrate metabolism. Its normal functioning is essential for the maintenance of blood glucose levels and its continued supply to organs that require a glucose energy source. This central role of the liver in glucose homeostasis offers a clue to the pathogenesis of glucose intolerance in liver diseases but little insight into the mechanisms of liver disease in diabetes mellitus. Fat is stored in the form of triglyceride and may be a manifestation of increased fat transport to the liver, enhanced hepatic fat synthesis, and decreased oxidation or removal of fat from the liver.

## Objectives

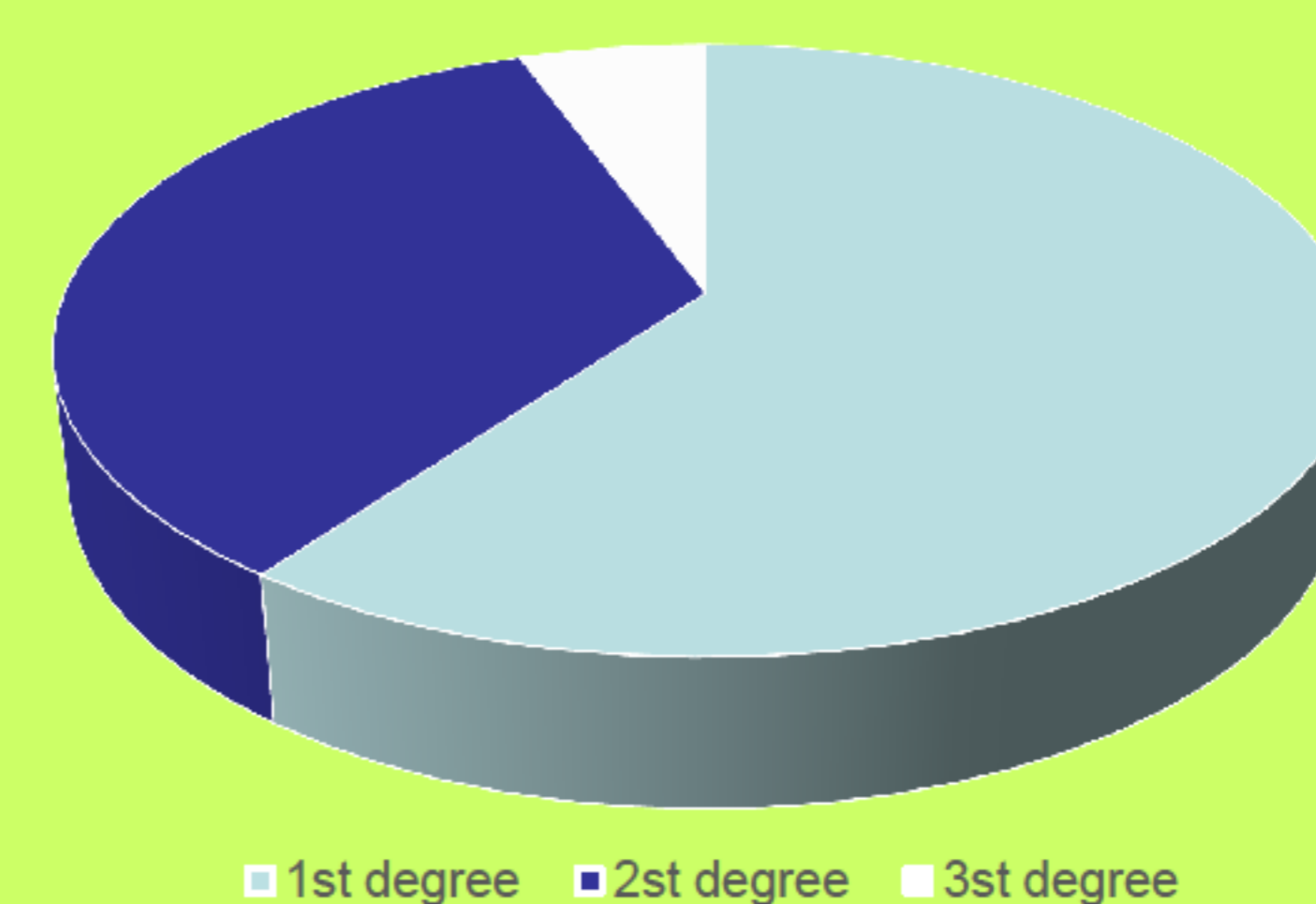
The goal of this investigation was to study features of changes in the level of adiponectin (AN), depending on the function of the liver and IR index in patients with NAFLD and type 2 diabetes mellitus (T2DM) and AO.

## Methods

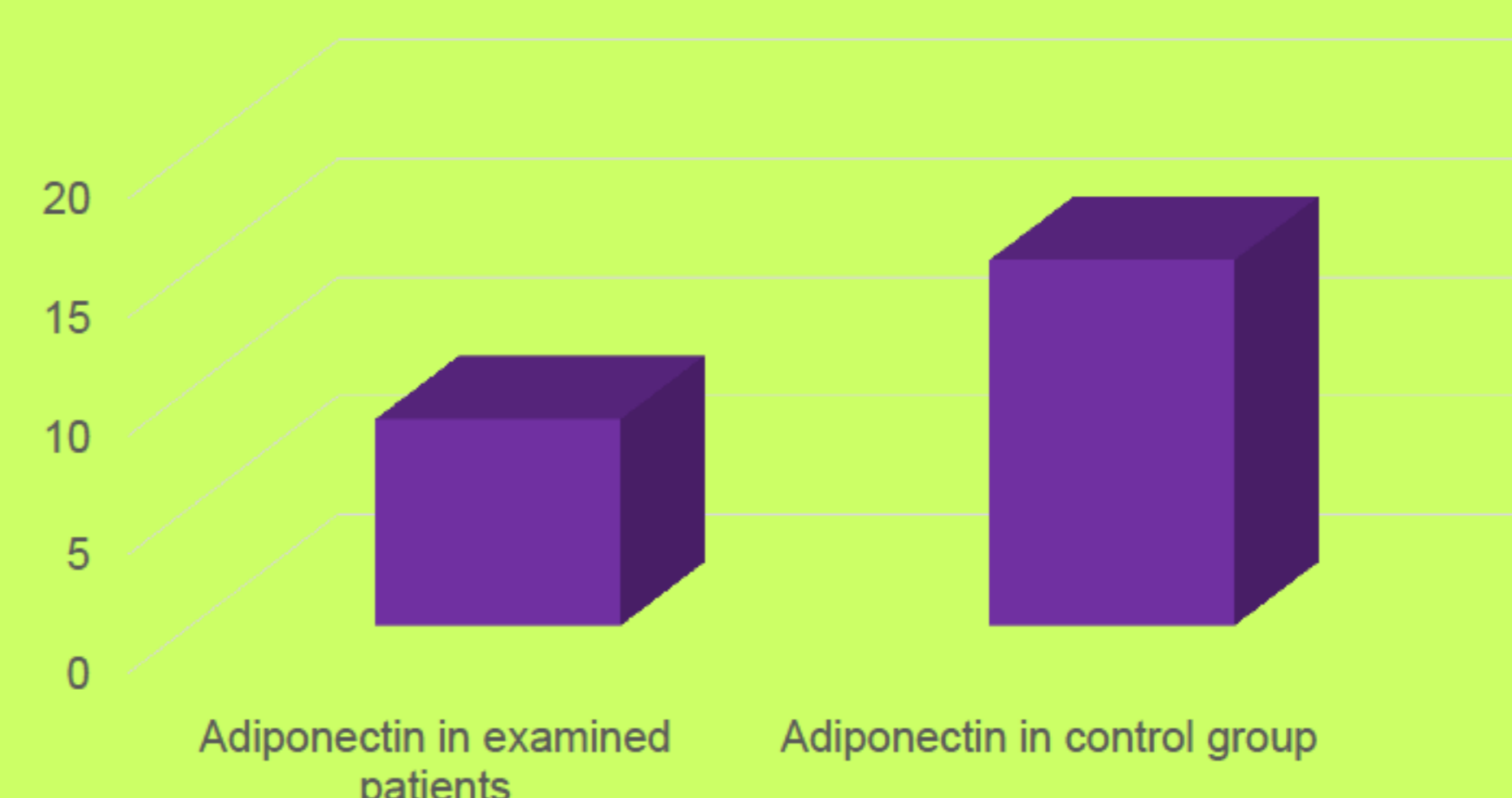
25 patients with NAFLD and DM2 (HbA1c<7.5%) and control group (n=10) underwent clinical examination including assessment of body mass index (BMI), waist circumference (WC), liver function (transaminases – ALT, AST) and index HOMA-IR.

## Results

The changes in BMI were observed in 94.5% of patients, including obesity 1st degree - in 54.6%, 2nd degree - in 31.4% and 4.6% - obesity 3rd degree [Pic. 1]. AN level was reduced compared to the control ( $8.7 \pm 2.4$  ng/ml vs.  $15.4 \pm 2.1$  ng/ml,  $p < 0.05$ ) [Pic. 2] and correlated with the degree of obesity -  $6,5 \pm 2,1$  ng/mL in patients with grade 3 obesity ( $p < 0.05$ ). There was a negative relationship between the level of AN and BMI ( $r = -0.36$ ;  $p < 0.01$ ), WC ( $r = -0.34$ ;  $p < 0.05$ ). The level of AN significantly decreased with increasing levels of ALT ( $r = -0.44$ ,  $p < 0.001$ ) and AST ( $r = -0.46$ ;  $p < 0.001$ ). An inverse relationship between the level of AN and the index HOMA-IR was determined ( $r = -0.46$ ;  $p < 0.001$ ).



Pic. 1. Different degrees of obesity.



Pic. 2. Adiponectin plasma levels (ng/ml).

## Conclusions

Hypoadiponektinemia in patients with NAFLD and DM2 is associated with AO, deterioration of the liver function and progression of IR that contributes to the further development of metabolic abnormalities in liver.

