

AEROBIC EXERCISE INCREASES CATALASE ACTIVITY AND DECREASED LEVELS OF LEPTIN AND TNF α IN PATIENTS WITH LIVER DISEASE

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INTRODUCTION

Both insulin resistance and oxidative stress are implicated in the pathophysiology of various diseases such as type 2 diabetes mellitus, atherosclerosis or liver disease. Furthermore, the uncoupling protein-1 (UCP1) is involved in induced thermogenesis, related to the pathogenesis of obesity and diabetes. The aim of this study was to assess the impact of aerobic exercise on the inflammatory profile in patients with chronic hepatitis C.

METHODS

We designed an experimental prospective (before-after) study that included patients with chronic hepatitis C and insulin resistance but without associated metabolic syndrome. An individualized program of aerobic exercise (3 sessions of 60-minute/week) for 16 weeks was designed. Electrical bioimpedance analysis was performed (TBF-612 Tanita). Variables were determined (antioxidant markers and adipokines) before and after the intervention. Serum leptin and TNF-alpha concentrations were measured using commercial kits for ELISA (Immunotech, Coulter Corp., Westbrook, MA, USA). The catalase activity was inflammatory cytokines monitored with a commercial kit (Cayman Chemicals, Michigan USA).

RESULTS

A total of 34 patients were included. The mean age was 46.8 ± 5 years and 22 were male (65%). The mean baseline BMI was 25.7 ± 3.5 kg/m² and excess weight of 6.17 ± 6.67 kg. Adherence to the exercise program was 88%. After 16 weeks of the exercise program, a significant increase in catalase enzyme levels (20.37 ± 1.32 vs. 27.33 ± 1.94 mmol/min-1/mL-1, $p = 0.005$) and a decrease of leptin (14,500 vs 11,500 pg/mL, $p < 0.05$) and TNF α (0.65 vs 0.05 pg/mL, $p < 0.05$) levels were detected. On the other hand, the concentration of uncoupling protein-1 (UCP1) showed a statistically significant increase after exercise (305.2 vs 510.5, $p < 0.05$).

Table 1. Evolution of bioimpedance analysis variables

	Baseline	Week 16	Sig. (p)
Body weight (kg)	73.6	73.4	0.703
Fat weight (kg)	14.5	13	0.011
Muscle weight (kg)	30	32	0.012
Bone weight (Kg)	11.2	11.2	0.186
Overweight (kg)	7	5	<0.001

Figure 2. Leptin levels

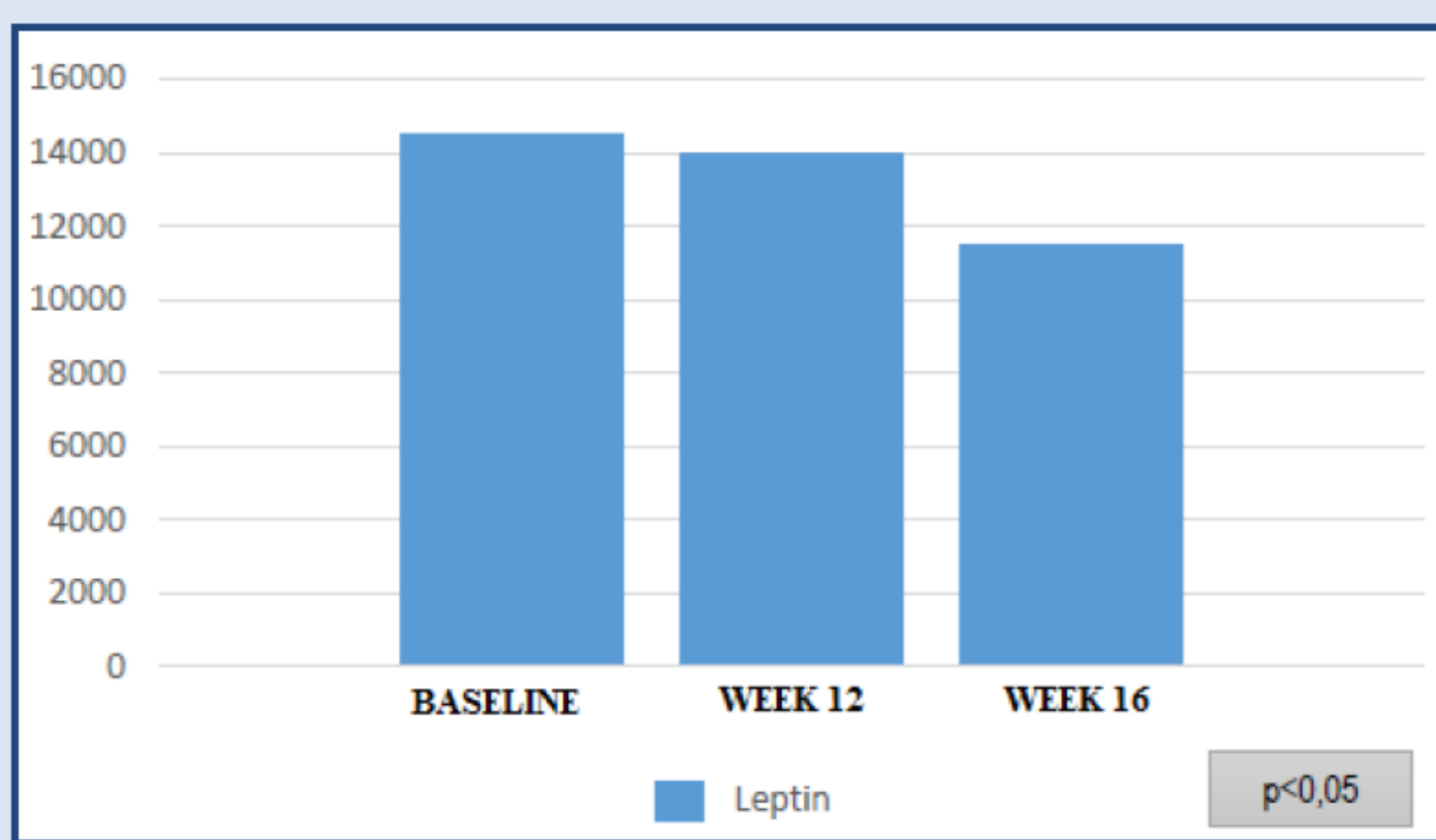


Figure 4. Uncoupling protein-1 levels

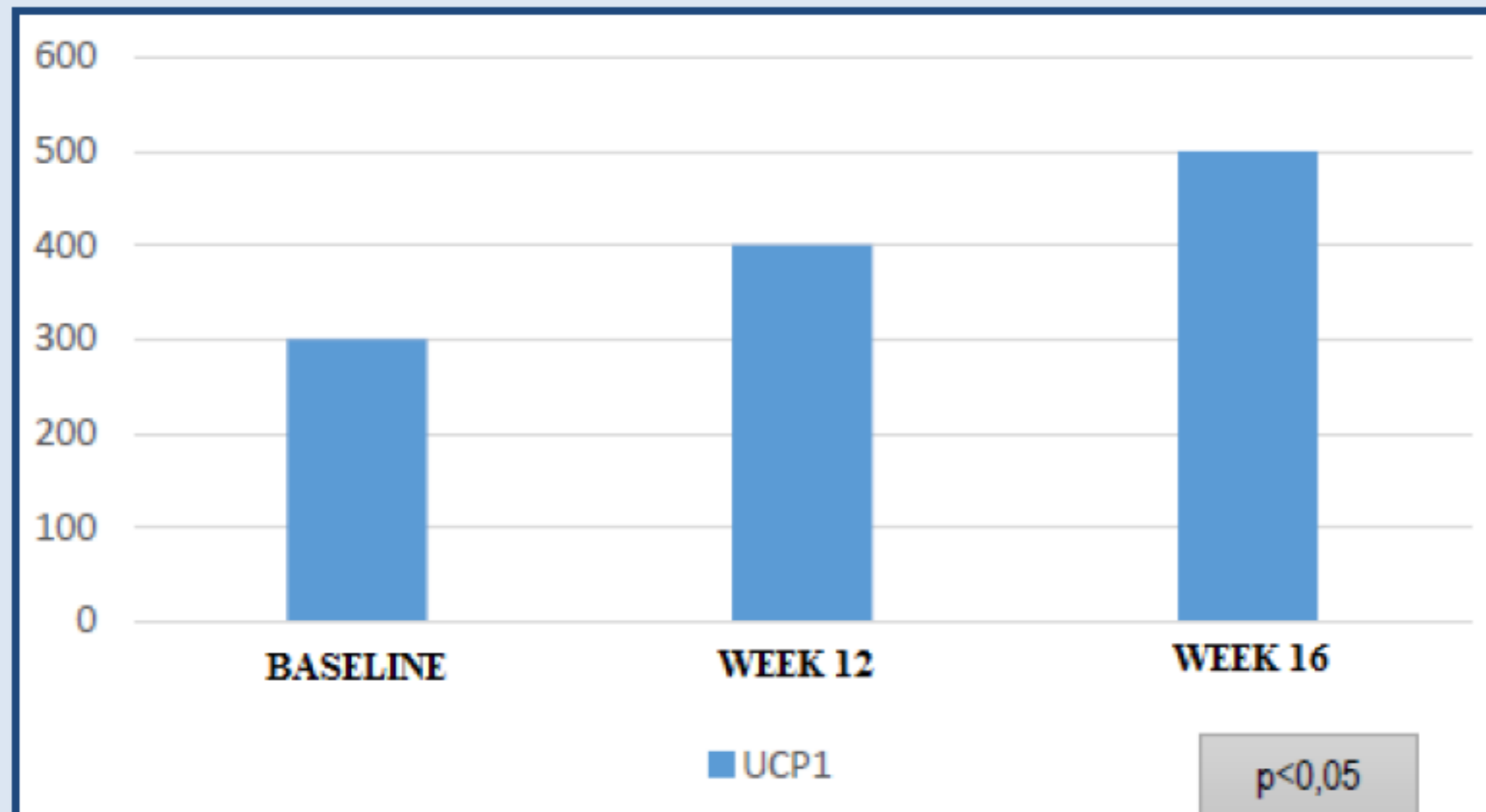


Figure 1. Increase in catalase enzyme levels

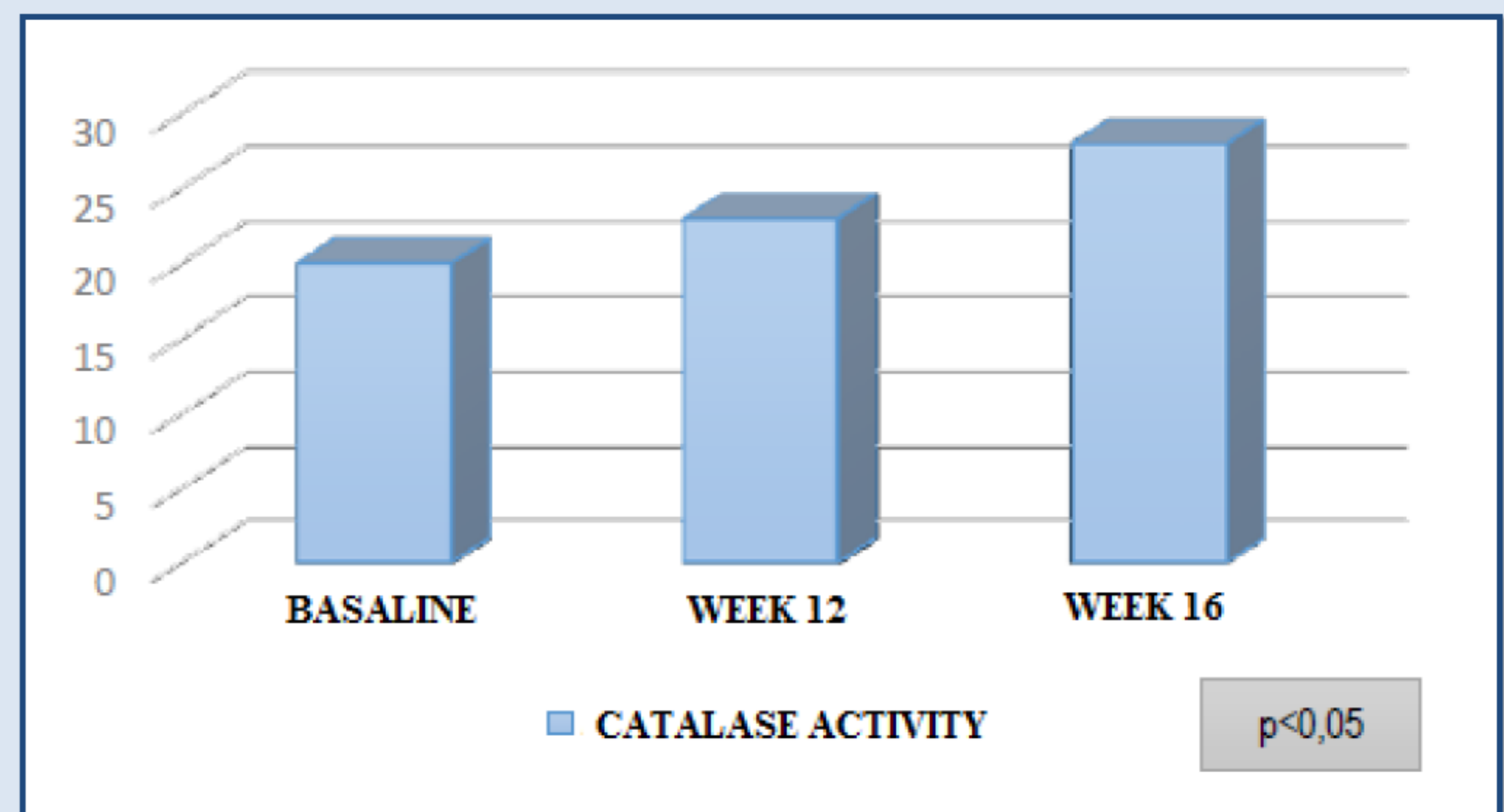
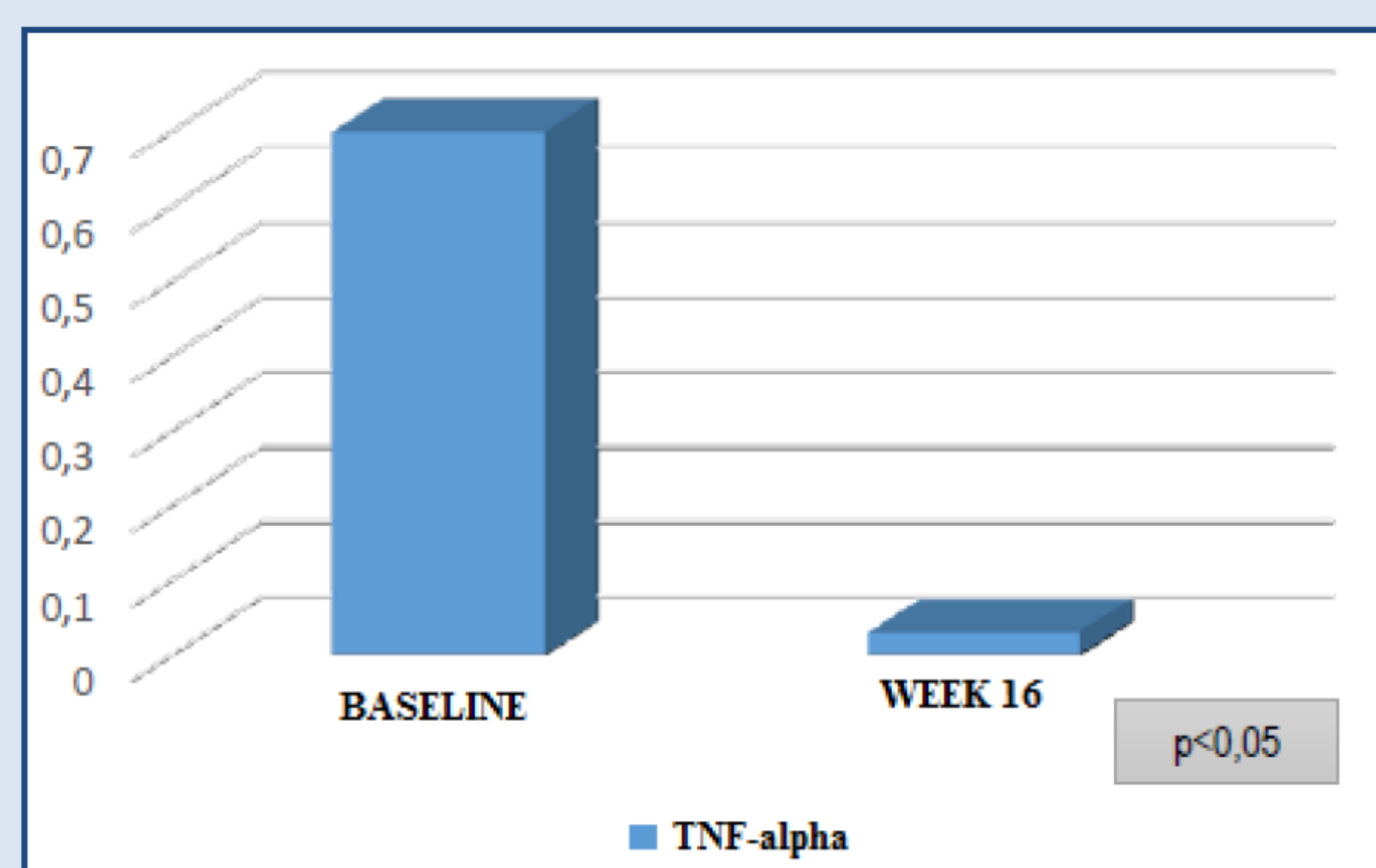


Figure 3. TNF α levels



CONCLUSIONS

In our series, the prescription of an individualized aerobic exercise program, controlled and monitored for 16 weeks, improved antioxidant status and decreased levels of proinflammatory cytokines and adipokines in patients with chronic liver disease and insulin resistance.