

## Effect of 8 Weeks of Intervention on Physical Fitness, Hepatokines, and Insulin Resistance in Obese Subjects

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**Abstract :** Background: The aim of our study was to compare the effect of intensified lifestyle intervention on insulin resistance (HOMA-IR), alanine aminotransferase (ALT), aspartate aminotransferase (AST), and Fibroblast growth factor (FGF) 21 after 8 weeks of lifestyle intervention. Methods: A group of 43 obese patients (13M/30F; 43.0±12.4 years; BMI (body mass index) 31.2±6.3 kg/m<sup>2</sup> participated in a weight loss interventional program (NCT02325804) following an 8-week hypocaloric diet (-30% energy expenditure) and physical activity 150 minutes/week. Insulin sensitivity was evaluated according to the homeostasis model assessment of insulin resistance (HOMA-IR) and insulin sensitivity indices according to Matsuda and Cederholm were calculated (ISImat and ISiced). Plasma ALT, AST, Fetuin-A, FGF 21, and physical fitness were measured. Results: The average reduction of body weight was 6.8±4.9 kg (0-15 kg; p=0.0006), accompanied with a significant reduction of body fat amount of fat mass (p=0.03), and waist circumference (p=0.02). Insulin sensitivity has been improved (IR HOMA 2.71±3.90 vs 1.24±0.83; p=0.01; ISIMat 6.64±4.38 vs 8.93±5.36 p ≤ 0.001). Total, LDL cholesterol, and triglycerides decreased (p=0.05, p=0.04, p=0.04, respectively). Physical fitness significantly improved after intervention (as measure VO<sub>2</sub> max (maximal oxygen uptake) (p ≤ 0.001). ALT decreased significantly (0.44±0.26 vs post 0.33±0.18 ukat/l, p=0.004); however, AST not (pre 0.40±0.15 vs 0.35±0.09 ukat/l, p=0.07). Hepatokine Fetuin-A significantly decreased after intervention (43.1±10.8 vs 32.6±8.6 ng/ml, p < 0.001); however, FGF 21 levels tended to decrease (146±152 vs 132±164 pg/ml, p=0.07). Conclusion: 8-weeks of diet and physical activity intervention program in obese otherwise healthy subjects led to an improvement of insulin resistance parameters and liver marker profiles, as well as increased physical fitness. This study was supported by grants APVV 15-0228; VEGA 2/0161/16.

**Keywords :** obesity, diet, exercise, insulin sensitivity

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