

## THE EFFECT OF N-STEAROYLETHANOLAMINE ON ADIPOCYTES FREE FATTY ACIDS COMPOSITION AND PLASMA LEPTIN OF RATS WITH OBESITY-INDUCED INSULIN RESISTANCE

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Obesity is a complex metabolic disorder often associated with insulin resistance (IR) as well as type 2 diabetes. Chronic hypernutrition and high fat diet rich in saturated fatty acids leads to molecular changes in insulin sensitive tissues (the liver, muscle and adipose tissue), impairment in insulin signaling and following dyslipidemia. Leptin is an important adipose tissue-derived hormone that has been shown to be involved in pathophysiological mechanisms of diabetes. That is why the aim of our study was to investigate the free fatty acid (FFA) composition of adipocytes and plasma leptin level of obesity-induced IR rats and its changes induced by the N-stearoylethanolamine (NSE)

The experimental model was induced by the 6-month high-fat-diet (HFD). NSE was administered as water suspension per os at a dosage 50 mg/kg of body weight daily during 2 weeks. Adipocytes were isolated from abdominal fat using Type 1 Collagenase solution. Adipocytes lipid extract was separated on the fractions by thin-layer chromatography. Free fatty acids composition was analyzed by gas-liquid chromatography. The fatty acids desaturase activity  $\Delta 9$ -D was estimated using product-to precursor index (oleinic/stearic acids ratio). Plasma leptin level

was measured using ELISA. Experimental data were processed statistically using Student's *t*-test. The statistical significance was determined for  $P < 0.05$ .

The investigation of FFA content demonstrated that the content of saturated FFA significantly increased in adipocytes of obese IR rats compared to control. The assay of unsaturated FFA showed a statistically significant growth in monounsaturated and bi-unsaturated FFA content whereas the level of polyunsaturated FFA decreased dramatically in IR-group in comparison to control. The plasma leptin content growth was also observed in IR rats in comparison to control. NSE administration had a considerable effect on normalization of FFA composition and caused statistically significant decrease in plasma leptin level in IR rats.

It was demonstrated, that obesity-induced IR caused by prolonged HFD leads to impairment in adipocytes FFA profile and is followed by the considerable increase of leptin content in plasma. As far as NSE administration normalized FFA composition of adipocytes and plasma leptin level, we can consider NSE as a prospective agent for the treatment of obesity.