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THE EFFECT OF N-STEAROYLETHANOLAMINE ON AGE-RELATED AND DIET-INDUCED CHANGES OF FATTY ACID PROFILE OF RAT ADIPOCYTES

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Introduction. Chronic hypernutrition and high fat diet (HFD) rich in saturated fatty acids leads to changes in insulin sensitive tissues, impairment in insulin signaling and followed by dyslipidemia. Phospholipids as one of the main component of cell membranes are involved in mechanisms of insulin signaling and a pool of free fatty acids (FFA) plays an essential role in the development of inflammation. That is why the aim of our study was to investigate the fatty acid (FA) composition of different lipid fractions of adipocytes in different age rats with HFD-induced obesity and insulin resistance (IR) and their changes under N-stearoylethanolamine (NSE) administration.

Methods. The experimental model was induced on 10-month- and 24-month-old rats by HFD and confirmed by the oral glucose tolerance test. NSE was administrated per os for 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. FA composition was analyzed by gas-liquid chromatography. Experimental data were processed statistically using Student's *t*-test. The statistical significance was determined for $P < 0.05$.

Results. The investigation of FA composition of PL demonstrated that total content of FA is significantly higher in Control and IR groups of 10-month-old rats compared to the same groups of aged animals and NSE normalized FA content in adipocytes

PL of the elder rats. In both age groups after HFD we observed statistically significant growth of saturated fatty acids (SFA) as well as unsaturated ones (UFA). There was no significant difference in the ratio of SFA:UFA between control animals at different ages but HFD induced a considerable decrease of FA saturation in PL of adipocytes of elder animals.

It was also demonstrated that total content of FFA is significantly higher in elder control rats than in younger intact animals. The percentage of SUFA was the same with monounsaturated FA (MUFA) in FFA composition of adipocytes of younger rats whereas MUFA level prevails upon SUFA in elder group. The assay showed that HFD caused a considerable growth of FFA content in adipocytes of 10 month old rats and NSE affect positively on its normalization.

Conclusions. It was demonstrated, that prolonged HFD induced IR and leads to changes in FA profile of adipocytes in rats from two age groups. As far as NSE administration had a positive effect on normalization of FA composition of lipid fractions of adipocytes, we can consider NSE as a prospective agent for the treatment of obesity-induced complications and correction of age-related dyslipidemia.

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