EFFECTS OF N-ACYLETHANOLAMINES ON THE PROLIFERATION, MITOTIC ACTIVITY AND DIFFERENTIATION OF MYOGENIC CELLS *IN VITRO*

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Synthesis of N-acylethanolamines (NAE) increases under different pathological conditions in mammalian organisms. These lipids, along with the specific CB1, CB2 receptors, the GPR18, GPR55, GPR119 G-protein coupled receptors, vaniloid receptors and transporter proteins form the endocannabinoid regulatory system. Therefore, in this work we investigated the influence of N-stearoylethanolamine (NSE), oleoylethanolamine (OEA) and N-acylethanolamines mixture (NAEs) on proliferation, mitotic activity and differentiation of primary embryonic myogenic and fibroblast-like rat cells in culture. Cell viability ambiguously depends on type and concentration of NAEs. NSE (in an inverse concentration manner) raises cell viability and their mitotic activity, and in concentrations of 10 μM increases the quantity of low-differentiated myoblasts. The OEA application showed that cell viability stimulative doze is 1.0 μM. The application of NAEs mixture repressed proliferative and mitotic activity in cell culture and decreased the quantity of low-differentiated myoblasts. Apoptotic level studies of embryonic cells showed that the level of apoptosis was the lowest in cultures that were cultivated with the NAEs mixture. Differentiation level analysis showed that the highest proportion of multinuclear myosymplasts was observed after treatment with 10 μM NSE and 1 μM OEA. In the other cases the quantity of myosymplasts was lower than in control. Despite their low quantity, all these myosymplasts had furcated multinuclear structure: the number of nuclei in these myosymplasts was much higher than in the control cells for NSE and NAEs mixture at 0.1 μM concentrations and for OEA at 1.0 and 10.0 μM concentrations. Significantly, application of NAEs mixture to embryonic cells caused formation of a great proportion of roundish cells, unlike the control samples, which contained elongated cells. This could be the evidence of a differentiation phase disorder in myogenic cells. Also of note was the fact that all cell cultures had a lot of vacuolized cells, conceivably adipose, that may suggest a failure of lipid metabolism in the experimental cultures.