Influence of Creatine on the Functional State of Mitochondrial Permeability Transition Pore During the Long-Term Psycho Emotional Stress

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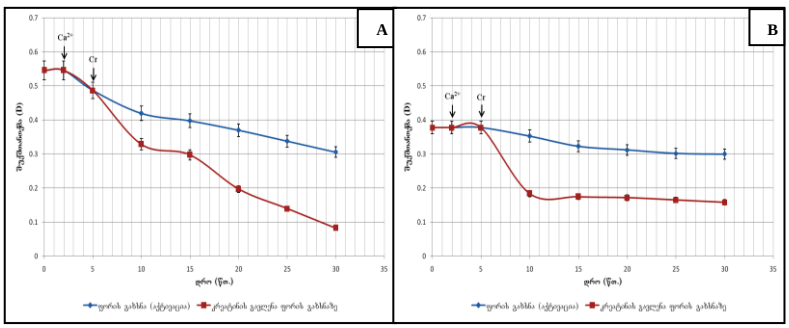
Stress, so influence of some environmental factors on an organism, can induce various negative results and some of them may have lethal character.

It was studied metabolic and structural changes in white, laboratory rats brain mitochondria during the 30-days isolation and circadian rhythm violation. It was shown, that in the studied conditions it has place various negative processes, such as increase of concentration Ca^{2+} and NO, activation of Lipid Peroxidation (LP) and simultaneously inhibition of activity of some important antioxidant enzymes. It was proved, that abovementioned conditions have a bad influence on the energetic metabolism too, what is declared by the decreasing in the activity of its enzymes.

According to the above stated in the second part of the experiments it was studied functional changes in the mitochondrial permeability transition pore (MPTP) during the long-term psycho emotional stress. I was shown, that in this conditions MPTP has experienced some functional changes, which is seen from the specific action on the pore of its inhibitor (CycA) and activator (Ca^{2+}).

Therefore, according to the scientific literature it was interesting to evaluate protectoral influence of the creatine (Cr), important nitrogenic agent acting in energetic metabolism, on the MPTP in the studied conditions, but from the results the protectoral character of the Cr wasn't declared and apart from this it has induced increase of degree of MPTP opening (Pic.1. Control (A) and Stressed (B) animals; y - OD and x - Time (min)).



From the above mentioned it is clear that the long-term psycho emotional stress induces various negative processes, which is proved by the changes in signal system, also activation of peroxidation and inactivation of various metabolic pathways. Additionally, there is some structural changes, for instance dysfunction of MPTP.

What about the fact that Cr hasn't shown the protector role, at this time it is difficult to conclude this, because it could be induced by various factors, also by the Mg^{2+} ions, which is the cofactor for the creatin kinase (CK) the catalyst enzyme of Cr/PCr cycle.