extinction session LR saline rats were characterized by higher levels of serotonin (5-HT) and its metabolite: 5-hydroxyindoleacetic acid (5-HIAA) in the prefrontal cortex and higher levels of 5-HIAA in the amygdala, compared to HR saline rats. The pretreatment of HR rats with D-cycloserine and midazolam caused the marked increase of 5-HT and 5-HIAA levels in the prefrontal cortex and a decrease in 5-HT and 5HIAA concentration in the amygdala. These results suggest that increased anxiety of HR rats may be due to a deficit in serotonergic neurotransmission in the prefrontal cortex and limbic structures, which have important role in the processing of conditioned fearful stimuli. Moreover, anxiolytic drugs (D-cycloserine and midazolam) attenuated freezing responses and normalized serotonergic neurotransmission.

Anti-atherosclerotic action of agmatine in apoE-knockout mice

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Agmatine is an endogenous polyamine produced by decarboxylation of L-arginine and exerts a wide array of biologic effects. It has been shown that agmatine has anti-inflammatory function, inhibits the proliferation of smooth muscle cells, protects the mitochondria and modulates fatty acid metabolism. These properties of agmatine makes it an interesting candidate for anti-atherosclerotic compound.

The aim of the study was to investigate the effect of exogenous agmatine on the development of atherosclerosis in apoE-knockout mice and identify the most probable mechanisms responsible for anti-atherosclerotic action of agmatine.

The research was carried out on male apoE-knockout mice at the age of 8 weeks. Animals were divided into two groups: control group (on chow diet, n = 10) and treatment group (on chow diet mixed with agmatine, at a dose of 20 mg/kg b.w./day, n = 8). Both methods en face and cross section showed that agmatine by 40% inhibited formation of atherosclerotic plaques. Immunohistochemistry showed that agmatine may increase plaque stability by decreasing number of macrophages. Action of agmatine was associated with increase of the high density lipoproteins (HDL) in blood. Real-Time PCR analysis and proteomic methods showed that agmatine modulates the oxidation of fatty acid and cholesterol biosynthesis in the liver.

In the future, compounds with similar mechanism of action may represent new group of drugs for prevention and/or treatment of atherosclerosis and coronary heart disease.

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