Korsunov K.V

MONOAMINE CONTENTS IN CEREBELLUM OF BRAIN IN SUBMISSIVE AND DOMINANT RATS

Research Advisor: PhD, Associate Professor Popova L.D
Department of Biochemistry
Kharkiv National Medical University
Kharkiv, Ukraine

**Actuality.** Neurophysiological and biochemical studies of neurotransmitter status, providing the aggressive and depressive states formation, mainly focused on structures of emotiogenic limbic-neocortical systems of brain. At the same time, the role of cerebellum in these processes has not been studied, although cerebellum, which is an important structure of locomotor function regulation, obviously is involved to the realization of aggressive behavior. Furthermore, in recent years the articles, according to which the cerebellum is involved in regulation of higher cognitive and emotional functions, were published. Two forms of aggression in men are known to be described: impulsive and controlled (in animals - spontaneous and adaptive, respectively). Impulsive aggression is observed in patient with depression. Submissive rats can serve as experimental model of depression. Dominant rats demonstrate adaptive aggression. Monoaminergic brain systems have a great influence on the emotions and behavior in humans and animals and are involved in development of depression and aggression.

**Aim.** The aim of the investigation was to study the contents of serotonin, norepinephrine and dopamine in cerebellum of submissive and dominant rats.

**Materials and methods.** Work was carried out on 24 male rats of the young reproductive period. Distribution of animals into groups with alternative types of behavior was made using a model of emotional stress “Sensory contact” with some modifications. According to the results of testing, the animals were divided into 3 groups: dominant, balanced and submissive. Contents of dopamine, norepinephrine and serotonin in cerebellum were determined by fluorometric micromethod.

**Results.** According to the results, submissive and dominant rats differ in content of all studied parameters in the cerebellum. In dominant rats the serotonin and dopamine contents were higher, and the content of norepinephrine was lower compared to submissive animals. Rats with a dominant type of behavior didn't differ from balanced animals on the content of dopamine and serotonin, but the noradrenaline level in the
cerebellum of these animals was reduced. Serotonin and dopamine levels were significantly lower in cerebellum of submissive rats compared with balanced animals. These results are consistent with previous data on the content of biogenic amines in the hippocampus and frontal cortex.

Conclusions. Taking into account the neural connections of the cerebellum with the cerebral cortex and limbic system structures and the same direction of biogenic amine content changes in cerebellum, frontal cortex and hippocampus, it can be assumed that the cerebellum is involved in the formation of dominant/submissive behaviors, in the development of aggressive and depressive states.

Kuznetsova D.

RECENT DATA ABOUT MOLECULAR UNDERPINNINGS OF METABOLIC SYNDROME PATHOGENESIS

Research Advisor: Professor Leshchenko V.
Department of Pathological Physiology named by D. Alpern
Kharkiv National Medical University
Kharkiv, Ukraine

Actuality: Metabolic syndrome includes diabetes, obesity, arterial hypertension, ischemic heart disease. This syndrome got a title “deadly quartet”. Pathogenesis of metabolic syndrome is very complicated. It is studied intensively.

Materials and methods: Nowadays a great attention is payed to the part of insulin resistance as a link of parts of metabolic syndrome. Hyperglycemia is developing without insulin and it stimulates secretion of insulin, so increasing of insulin level in plasma can cause heavy insulin glyceria redoubles ability of angiotensin II to activate a nuclear factor kB (NF-kB) in smooth muscles cells of vessels. Under influence of different factors NF-kB is been transporting from cytoplasm to nuclear and activates a big amount of genes. NF-kB is one of the key molecules detecting proinflammatory reactions in cells and stimulates synthesis of the TNF-α, IL-1, IL-6, which cause insulin resistance. Most lipids, including nonesterified fatty acids, can activate NF-kB. Lipotoxicity declares itself as “adiposopathy”. Adipocytes and macrophages, infiltrating adipose tissue, secretes mediators of inflammation, which, in addition, aggravate atherogenesis.

Results: So, insulin resistance, arterial hypertension, dyslipidemia, cardiovascular diseases can be considered as manifestations of