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METHODICAL AND METHODOLOGICAL PRINCIPLES OF THE EXPERIMENTAL RESEARCH OF BEHAVIOR AND FUNCTIONS COGNITIVE OF THE BRAIN OF ANIMALS (MODERN STATE OF THE PROBLEM)

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Key words: cognitive behavior, search activity, hexagonal problem box

The new means of studing of cognitive behavior and search activity in rats is offered in hexagonal problem box (HPB) with regular changing of inside environment (Patent RUS 2432902. 17.11.2009. Grigor'ev N.R., Cherbikova G.E., Yur'ev E.Yu). The device HPB reflect the function organization of grid cells in a hexagonal pattern located in the entorhinal cortex of hippocamp (O'Keefe, M.B. and E.Moser's, 2014). The populations of hippocampal neurons encode information about the recent past, the present, and the future according prognosis probability theory. In grid cells in the medial entorhinal cortez of brain there are all neurons nessesary for navigation in HPB. The level of cognitive abilities of navigation system in rats may be exactly measured in HPB. The fact of existence grid cell hexagonal forms in entorhinal cortex confirms measurement method cognitive abilities in HPB.

The pattern of the rat's behavior in the chamber corresponds to the location of the nodal control points of the cells of the hexagonal neurophysiological system - the cognitive brain map. Six reference points of the hexagonal cellular network ideally correspond to the arrangement of six exit doors of the chamber. The central inlet of the chamber corresponds to the seventh central reference point. Tracks of movement of the rat and the corresponding excitation of the spatial cells are correlated with the actual pace of the rat in the problem chamber from the center to the selected chamber door. This pattern of architecture is a mental reflection of the solutions of spatial problems from a few centimeters to meters and a measure of the distances of movements that perform an integrative function and act as a compass. They are active when the animal's head points in a particular direction. Cells of hexagonal architecture are activated in collisions with walls (closed doors in our technique)

The real rushing of rats in the relatively closed space of the chamber after the formation of the cognitive map has a rectilinear radial direction from the center of the chamber to the unlocked doors. Such coincidence of the neurophysiological picture of the excited cells of the cognitive brain map with the real behavioral pattern cannot be accidental, with their 100% correlation of the psychic and the physiological meaning. This fact really confirms from the point of view of behavior and neurophysiology the presence of cognitive abilities in rats and the possibility of their correction by some nootropic drugs, as well as the violation of these higher brain functions by narcotic substances.

When the cognitive map constructed by the brain will fully correspond to the real changes in the situation on the ground, the probability will be equal to 1, or 100%. Such an option can and should be considered the information equivalent of the cognitive process, the complete correspondence of the mental image of the cognitive map to the objectively existing real problem.

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THE LIPID OF LIVER MICROSOMES OXIDATION ENZYMATIC MECHANISMS IN VITRO IN THE PRESENCE OF NICOTINE, HEXAMETONIUM

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Keywords: nicotine, gexametonium, enzymatic mechanisms oxidation , microsomes

Abstract. Work´s carried out to determine the ability to oxidize lipids of liver microsomes enzymatic mechanisms in the presence of nicotine, gexametonim were. The results showed- nicotine incubation medium molar concentration of 10-4 M and 10-5 M ; 10-6 M in during of the induction of enzymatic (NADP • H –dependent) mechanisms of POL leads to a decrease in lipid oxidation in the microsomes of the liver. The presence gexametonium (10-4 M ; 10-5 M ; 10-6 M) in the incubation medium with lipids of liver microsomes to increase the ability to oxidize lipids of liver microsomes in the activation of enzymatic mechanisms.

Experimental work to determine the effects of cholinergic mechanisms on the peroxidation (free radical) oxidation of lipids of the liver in the cooling period the animals that the introduction of pharmacological agents augmentative and reducing work N - cholinoreactive structures of the liver tissue exercise influence on the content of products, substrates of lipid oxidation in the liver and affects the change of conditions conducive to the development of the POL of the liver in the period of cooling of the animals were showed.

But the question about the ability of the chemical elements included in the structures of the agonists, antagonists N- choline receptors tissue of the liver - nicotine, gexametonium to induce a variable valence and thus had an influence on the lipid peroxidation of the liver was not clarified.

In this regard, conducted a series of experiments associated with the induction of lipid peroxidation of liver microsomes enzymatic (NADP • H –dependent) mechanisms in the incubation medium, in the presence of lipids of liver microsomes and individual presence nicotine, gexametonium in the incubation medium.

The conducted work that nicotine incubation medium molar concentration of 10 -4 M and 10 -5 M ; 10 -6 M in during of the induction of enzymatic (NADP • H –dependent) mechanisms of POL leads to a decrease in lipid oxidation in the microsomes of the liver and decreasing the molar concentration of nicotine in the incubation environment, the ability of the lipids of liver microsomes to oxidize increases was showed.

The presence gexametonium (10 -4 M ; 10 -5 M ; 10 -6 M) in the incubation medium with lipids of liver microsomes, in contrast to nicotine had led to the opposite effect – to increase the ability to oxidize lipids of liver microsomes in the activation of enzymatic mechanisms POL and decreasing the molar concentration of hexametoni in the incubation environment, the ability of the lipids of liver microsomes to oxidize increased.

Thus, the presence of nicotine in the incubation medium while induction enzymatic mechanisms for POL reduces the ability of the lipids of liver microsomes oxidation and decreasing the molar concentration of nicotine in the incubation medium noted an increase in the ability of the lipids of liver microsomes to oxidize was.

Gexametonium the presence in the incubation medium resulted in opposite in respect to the nicotine effect is to increase the ability of the lipids of liver microsomes by oxidation and reduction of molar concentration gexametonium in the incubation medium led, in the case of nicotine to increase the ability of the lipids of liver microsomes to oxidize.

Summarizing the experimental data we can note the following - the presence of pharmacological agents - nicotine, gexametonium in the incubation medium under the induction of enzymatic mechanisms for POL leads to different trends of oxidation in lipids of liver microsomes.

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LIPID LIVER OXIDATION INDUCED BY NONENZYMATIC MECHANISM IN VITRO IN THE PRESENCE OF NICOTINE, HEXAMETHONIUM

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Keywords: nicotine, gexametonium, nonenzymatic mechanisms oxidation , microsomes, in vitro

Abstract. Work´s carried out to determine the ability to oxidize lipids of liver microsomes nonenzymatic mechanisms in the presence of nicotine, gexametonim were. The results showed – nicotine in an incubation medium of a molar concentration of 10-4 M increases the oxidation of lipids microsomes, molar concentration of nicotine of 10-5M, 10 -6M decrease a microsomal lipid oxidation.

Hexamethonium of the incubation medium (10-4 M, 10-5 M, 10-6 M) reduces the ability to oxidize.

Experimental work out to determine the ability of nicotine, hexamethonium to influence the oxidation of lipids liver microsomes during the activation of enzymatic (NADP • H-dependent) LPO mechanisms in vitro was carried.

Data testify to a multidirectionality of the results was received. The enzymatic mechanisms LPO of the incubation medium in the presence of nicotine induction of decreases, and the ability of lipids liver microsomes to oxidize hexamethonium was increases.

Effect of the nicotine, hexamethonium on the peroxidation of liver lipids in inducing non-enzymatic (ascorbate-dependent) mechanics was remained unresolved.

The results of the experiments that the presence of nicotine in an incubation medium of a molar concentration of 10-4 M increases the oxidation of lipids microsomes of the liver was showed.

Molar concentration of nicotine of 10-5M, 10-6M in the incubation medium decrease a microsomal lipid oxidation when lipid microsome oxidation induced by nonenzymatic mechanisms was.

Hexamethonium of the incubation medium (10-4 M, 10-5 M, 10-6 M) when inducing non-enzymatic mechanisms of LPO reduces the ability of liver liposomes to oxidize, the decrease in the molar concentration of hexametonium both,