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The Behavioral Role Of Hupotalamic And Sensamotor Posts In Specification

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ABSTRACT

This article is devoted to the study of the sources that constitute the methodological foundations of the study of the hypothalamus and sensorimotor cortex behavior control in thirst.

KEYWORDS

Thirst, hypothalamus and sensorimotor cortex, behavior management, methodological basis, adaptation, neurobiology, physiological mechanism, bioenergetics of the organism.

INTRODUCTION

One of the most important and little-studied areas of modern neurobiology is the evolutionary approach to environmental laws, natural forms of adaptation, physiological mechanisms of functioning of a number of physiological systems in the process of adaptation to the habitat of animals with different phylogenetic lines and ecological specialization.

In this context, the study of the comparative role of the regulatory and motivational properties of a number of vertebrate organisms and the remarkable natural forms of their adaptation to adverse environmental conditions remains an urgent task.

E. Haeckel's fundamental views on the interconnected development of evolutionary organisms and the environment, I.P Pavlov's theory of conditioned reflexes, A.N Severtsov's theory of idioadaptive concept and aramorphosis, L.A. Orbeli's evolutionary and theoretical views, A.A .Ukhtomsky's

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dominance. The study of these areas, based on the theory of ecological and evolutionary views of D.A. Biryukov, A.I.Karamyan and A.S.Batuev on the difficult, crisis stages of development of brain integratum and activity in vertebrate phylogeny, now leads to extensive research.

THE MAIN FINDINGS AND RESULTS

Among them, one of the main tasks is to determine the variability of various functional systems in the process of oriented adaptation of the organism to extreme living conditions. However, despite the fact that the physiology of the functional interactions of the organism has been studied for several decades, not all the integrated systems of the brain have been fully studied. This is primarily due to the study of the role of the hypothalamic-cortical relationship in the organization of thirst and hunger motivation.

It is known that among the environmental factors, temperature is a factor that has a rapid impact on the body. [7; 27-29]. Quantitative criteria of temperature and their extreme fluctuations under natural conditions play a key role in supporting homeostatic processes.

Under the influence of temperature there is a significant increase in functional activity, changes in the electrical activity of organs, shifts in the regulation of metabolism and water-salt metabolism, its hormonal and neuropeptic status is determined in different physiological states of the organism. This problem has been studied regularly: Egorova N.A, Anoxin P.K, Askerov F.B, Gasanov G.G, Alekperova S.A, Nuritdinov E.N, Akhrorov D.T functional under the influence of temperature studied a significant increase in activity.

The results of these studies show that long-term and rapid exposure to high temperatures leads to the development of hyperthermia, accompanied by physiological, general-biological and physicochemical changes that cause serious disturbances in the functioning of functional systems.

Heat load leads to a significant loss of water and salts, electrolyte volume and blood composition, its elements in a certain form, the volume of loss of living mass and problems of changing the bioenergetics of the organism. It has been studied by scientists such as Gasanov G.G, Askerov F.B, Alekperova S.A,Vander T, Kerner Y, Romsos D.R, Gafurov B.G. [1; 110-117; 2; 87; 3; 67-69]

Thus, the urgency of the problem is beyond doubt and plays a very important fundamental role in relation to the activity of the organism in the extreme conditions of Central Asia. Smirnov V.M, Fudin N.A, Tkhoroevsky V.I. have studied the negative effects of high temperatures on human physical activity while Meerson F.Z, Pshennikova M.G, Sulimov A.V. scientifically study that the above-mentioned condition leads to the development of important functional disorders and stressful reactions for the organism. [4; 86-89; 5; 17-19]

Changes in the level of functional activity of some systems associated with the introduction of mechanisms serve to increase heat transfer and thermogenesis. In this regard, A.D. Slonim's [7; 44-48] have a special value. Based on the teachings of A.A Ukhtomsky, the scientist introduces individual adaptation to environmental factors into the development of systemic and structural homeostasis based on objective laws in the cells of the organism as the formation of a dominant functional system.

The concept of "motivation" began to play an important role in physiology, and the higher nervous activity of animals is now involved in the interpretation of the facts identified in the study. A. Batuev writes that, regardless of the motivating reasons for a specific goal-oriented behavior, some scientists combined behavioral analysis and were eventually

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forced to refer to concepts such as 'passion', 'desire, inclination', 'drive' which were close to the concept of 'motivation'.

Physiologist Kassil V.G. from the point of view, motivation, just like concepts that mean states such as appetite, hunger, satiety, thirst - these are the mechanisms that form the basis of satisfying the biological needs of the organism. [3; 19-21]

According to the author, such an approach makes it possible to overcome the ambiguity that sometimes arises when using physiological terms. This view is consistent with I.P.Pavlov's views on basic passions, the "goal reflex" and A.A .Ukhtomsky's dominance, which determines the behavioral vector.

Thirst motivation is a typical example of the physiological dominance that occurs in the body in the absence of water and, accordingly, directs the state of search. The structures of the hypothalamus play a leading role in creating a state of subjective thirst. This problem was solved by Batuev A.S, Gafurov B.G, Batuev A.S, Li Yu.S, Lakomkin A.I. such as scientists have studied. [6; 13-14]

In this case, osmoreceptors are located, activating effects are directed to other signaling devices of the brain, even to the cortex of the large hemispheres. Given the scattering and contradictions of data pertaining to the central mechanisms of thirst, we found it necessary to systematically study the mechanisms of participation of different nuclei of the hypothalamus in the formation of thirst motivation. The purpose of the study was to study the behavioral responses of cats and rats to meet the body's need for water.

It should be noted that using the objective electrophysiological method, it is possible to observe the characteristics of the lateral section of the hypothalamus and its associated cortical areas in response to the transmission of conditional signals of different importance in thirst conditions.

For these purposes, it was necessary to study the nature of how the electrical activity of these structures of the brain changes during the execution of a system of conditioned reflex runs associated with free state and saturation with different nutrients. The aim of this study was to investigate the role of the hypothalamus and cerebral sensorimotor cortex in the management of thirst. Based on this, the following specific tasks were identified:

1. Study of the biological activity of the hypothalamus and cerebral sensorimotor cortex in cats kept on a salty diet;
2. Study of basic nutrient conditioned reflex activity in rats kept on a saline diet after bilateral disruption of the posterior lateral areas of the hypothalamus;
3. To study the effect of hypothalamic dysfunction on dry and wet food selection in animals;
4. Study of the electrolyte content of blood, urine and blood proteins in the conditions of a salty diet;
5. Study of base-nutrient conditioned reflexes under high temperature conditions;
6. Study of the electrolyte content of blood, urine and blood proteins under high temperature conditions.

The scientific novelty of our study is that for the first time in animals (cats, rats) kept on a salty diet, a description of the bioelectrical activity of the posterior lateral nuclei of the hypothalamus and the sensorimotor cortex of the brain was identified. However, in a momentary bilateral disruption of the posterior lateral nuclei of the hypothalamus, conditioned-reflex activity is developed with difficulty, while absolutely positive right-sided conditioned reflexes are found to be absent altogether. Experiments have shown that conditioned-reflex runs and unconditional

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eating are present in a strictly defined order in a normal diet. Conditioned-reflex runs to unsalted food are easier to form than salty foods. On the unsalted food side, the rats ate such a salty grain in the first test that they had previously rejected it when they ran to the "salty" manger. This is confirmed by another fact: during a strong and prolonged thirst during a salty meal was observed not only a decrease in the dynamics of the right conditioned reflex, but also the cancellation of the differential braking to sound signals. All of the above confirms that the adequate analysis of pathogens that signal the nutritional properties of water-salt balance in the context of an increase in sodium chloride in the body and a shift towards water deficiency is ensured by the interaction of external taste and internal viscerochemical sensors. Thus, the emergence of thirst motivation in rats is accompanied by certain transformations in the viscerochemical field of the organism, which in turn changes the initial properties of salty food intake in the taste chemical sensitivity system.

The study also showed that the main indicator of sodium excess is an increase in its concentration. Control of the amount of sodium in the blood plasma, reduction of the percentage of erythrocytes by hematocrit, reduction of the amount of protein in the blood plasma, sodium and water retention in the body and other types of asymmetric distribution of ions are known by means of the hypothalamic-pituitary system. For this reason, the study of the concentration of sodium, potassium, and oxylions in the blood, as well as the increase in daily diuresis during a continuous salty diet in cats, is another goal of the study.

The study also found that the thirst motivation generated through a salty diet and partial water deprivation was accompanied by the formation of a stationary excitatory foci with dominant features in the lateral section of the hypothalamus. Chemical stimulation of it by direct injection of sodium chloride into the lateral hypothalamus creates a stationary excitatory foci with dominant properties. Activates behavioral acts appropriate to the state of thirst. Prolonged presence of animals in high temperature conditions requires the emergence of specific behavioral reactions of the organism. In this case, the adaptation of the animal organism to this effect takes place, and the stabilization of the new physiological background occurs.

CONCLUSION

Thus, summarizing the above, it can be concluded that the morpho-functional mechanisms of water and food reactions reflect a complex system of dominance of animal behavior, which is controlled by numerous structures of the central nervous system. The study of these issues is of great scientific and theoretical importance, as it deals with biologically interrelated behavioral reactions of human and animal organisms.

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