

The concept of "integrative, pacemaker role of the hippocampus in the formation of stress syndrome" and dependence of clinical effectiveness

BRT

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Our experimental data allow us to formulate a concept based on our own original model of structural and functional reorganization and biocorrection of the hippocampus with acute and chronic stress.

The concept of "integrative, pacemaker role of the hippocampus in the formation of stress syndrome" allows to explain the polyynosology of the stress syndrome, especially the recent emergence of a nonspecific stem syndrome, which is due to the fact that the limbic system, as phylogenetically the most ancient formation, has a regulatory effect on the cerebral cortex and subcortical structures, thereby on the entire organism as a whole ...

The basis for the creation of this model was the results of this study using the BRD and morphological methods, during which it was found that of all the studied brain structures (limbic system, stem structures, cerebral cortex) involved in the response to technogenic stress forming a stress syndrome, it is the hippocampus that creates the interface the mechanism of communicative connections, with any structure of the brain, triggering the development of stress syndrome under the influence of exogenous environmental factors. Which is consistent with the literature data, when the stress reaction of the body, due to the morphological features of the organization of various sectors of the hippocampus, is accompanied by structural and functional reorganization and hyperfunction of the hippocampal relationship, inevitably manifested changes in the integrative triggering activity of the brain (Geinisman et al., Y. 1996, 1996a; Gabrielyan E.S., Amroyan E.A. et al., 1996).

We have found that the key system-organizing and the controlling link of the stressor's influence is the formation of a determinant with the mechanism of hyperactivation of sensory afferentation, in the form of a primary generator of pathologically enhanced excitation in the CA1 sector of the hippocampus. Electromagnetic excitation of the exteroceptive apparatus, regardless of the type of stimulation, visual, acoustic, olfactory, is projected onto the hippocampus. The CA4 sector of the hippocampus conducts the sensory flow of pathological excitation to the CA3 sector. The main functional load during acute stress occurs in the CA3 sector, with focal loss of neurons and the development of denervation syndrome, with changes in cyto- and synptoarchitectonics of the hippocampus. Sector CA2, thanks to its morphofunctional features, prevents the passage of excitation into the CA1 sector, performs a barrier function. In this regard, there is a reorganization into the CA1 sector, into group neuronal ensembles, which form a determinant in the form of a primary, pacemaker generator zone, with increased information content of neurons and reverberation of pathological impulses that trigger stress syndrome in the limbic structures of the brain. In this case, vicious circles turn out to be "linked" into a spatial scheme

the information cycle is switched on at a certain emotional state, activating the brain stem structures, both through general mechanisms reticular formation, and through the direct influences of the CA sector₃ on the CA sector_{one}. And if your own compensatory mechanisms are not enough for adaptation and early manifestations at the first and second stages of generalized adaptation syndrome were not identified and etiological and pathogenetic therapy was not connected, then the generator fixed in the CA1 sector causes a chronization of the process with access to target organs, due to an increase in the sensitivity of denervated structures. Then the determinant of the pathological system comes out from under the intrasystem, as well as intersystem and general integrative control, which ultimately forms the circuits of information circulation, forming a new stress-functional system, which is fixed due to constant activity by plastic processes, with the development of stress syndrome.

The revealed electrophysiological differences in the main sectors of the hippocampus correlate with the morphological data of our experiment, explaining the selectivity of lesions in various pathological conditions. In clinical terminology, the "Sommer sector" CA1 is opposed to the "Bratz sector" CA3, the "resistant" sector completely degenerates. Although the Sommer sector remains almost intact, which confirms the "laminar" principle of the organization of the hippocampus with a pronounced ability for slow accumulation and long-term preservation of information (Vinogradova OS, 1975). Which provokes the appearance of a "stagnant" focus of excitation (Aftanas L.I., 2000), due to the activation of additional neurons in the salvo activity in the hippocampus (Vinogradova O.S. et al., 2000). Allowing overactive neurons to combine into generators of increased excitation (Semchenko V.V., Stepanov S.S., 2003). Therefore, any stress response is accompanied by hyperfunction of the hippocampus, leading to the fixation of any types of sensory influences, regardless of the modalities of perception and the way of reproduction. (Vinogradova O.S., 2000; Geinisman Y. et al., 1996, 2001). Diffuse rupture, zones of focal loss of neurons, reorganize the neural circuits of the hippocampus, changing the intercentral relationships in the structures of the brain, causing the chronization of the process with access to the target organs, as a result of an increase in the sensitivity of denervated structures, the Kennon-Rosenbluth law is a general pattern of denervation syndrome. Similar changes occur both in the type of loss of functions and in the type of qualitative transformations of the existing neural networks of the brain with the formation of pathological systems, triggering the circuits of the circulation of pathological information (Papez JW, 1937; Anokhin P.K., 1962; Sudakov K.V., 1984; 1997). Therefore, congenital or acquired insufficiency of the natural resistance of an organ, under stress, can make them a target for those forms of pathology that initially did not have a selective "outlet" to a particular organ (Kryzhanovsky GN, 1997).

Knowing that the timely diagnosis of the initial stages of vicious circles and the elimination of the primary determinant in some cases, in chronic systems and even in the presence of secondary determinants, gives a positive effect, and the elimination of the main link in pathogenesis is the key to successful treatment of the patient (Dolgikh V.T., 2001) , clinical testing of the proposed

method of biocorrection of pathological zones of excitation in the hippocampus.

Taking into account the data obtained in the experiment on animals, clinical testing and literature sources, it follows that the hippocampus has multifunctional properties aimed at adapting the body to changing environmental conditions. With the formation of a pathological focus in the hippocampus, the phenomenon of reflection of the influence of the external environment is formed, aimed at adapting the body to changing conditions (Arushanyan E.B., Beyer E.V., 1997). Experimental work of A.D. Speranskii, by electrical stimulation of the base of the brain in the hypothalamus, when modeling pathological processes, the same type of changes in the nervous system with generalization of the process were also revealed, and the most varied in the nature of trophic disorders. This gave him grounds to draw a conclusion about the standard forms of the body's response to the action of extreme stimuli. The need was emphasized to consider diseases not only by their differences, but also by their similarities, to determine the leading links in the deployment of multi-link reactions.

The neuronal features of the brain stem structures revealed by our experiment in the form of very large neurons in the nuclei of the reticular formation, the facial nerve, the trigeminal nerve, the paraventricular nucleus of the hypothalamus, the amygdala complex of the limbic structures of the brain, make it possible to explain the nonspecific stem syndrome. Since even single large-cell neurons or small groups of them, united morphologically by "neuronal ensembles", are responsible for the autonomic regulation of a set of organs, with reflex spatial summation of excitation (R. Schmidt, G. Tevs, 1996). One large neuron simultaneously sends signals to several tens of thousands of cells, and itself receives information of no less volume. Pathways, isolating the nuclei as morphological formations, functionally integrate them into

distribution systems, regulating sensory, motor, neuroendocrine activity and other physiological rhythms.

We have found that the pacemaker, dominant zone in sector CA1 hippocampus, activates secondary foci of excitation, in the nuclei of the hypothalamus, thalamus, cortical hippocampal amygdala, in the limbic cortex, brain stem structures, due to morphological features in the nuclei of the trigeminal, facial, visual, olfactory, vagus, reticular formation, cerebellum with access to the peripheral structures of the body.

Therefore, interference in the work of the hippocampus should a priori be reflected in the activity of the endocrine system, since it becomes pathological under the influence of a stressor and the chronization of the process without the formation of a secondary generator. Due to the fact that the normal or reorganized rhythm of corticosteroid secretion should modify the oscillatory processes in the hippocampus. Thus, it is legitimate to state the conjugation of cyclic processes in behavior and the endocrine sphere with the direct participation of the efferent functions of the hippocampus (Beyer E.V., Arushanyan E.B., 2001). Therefore, the elimination of the pacemaker focus of excitation in the hippocampus, provoked by stress, is an etiopathogenetic therapy. Such a complex therapy weakens the mutually potentiating positive connections within the system and in

generator, contribute to the disintegration of the pathological system and suppression of the generator (Litvitskiy P.F., 1997), and as a result of the rupture of causal relationships.

Example 1

Patient V.D., 15 years old. Two months of inpatient treatment for parenchymal jaundice in an infectious diseases hospital. During treatment, direct bilirubin increases from 150 $\mu\text{mol} / \text{L}$ to 490 $\mu\text{mol} / \text{L}$ (the norm is 0.9–20 $\mu\text{mol} / \text{L}$). The diagnosis of parenchymal jaundice was not confirmed, since markers of viral hepatitis were not found, ultrasound showed signs of a tumor of the gallbladder with the transition to the head of the pancreas, during the operation were not confirmed. During the operation, the diagnosis was not verified, with inpatient treatment for two months in the surgical department, hyperbilirubinemia increased, the general condition worsened. We applied after four months of inpatient treatment. During the examination using this technique, a pathological zone in the hippocampus was revealed (anamnesis confirmed the onset of the disease one day after emotional stress). According to bioresonance diagnostics, it was revealed that the primary excitation zone was localized in the CA1 sector of the hippocampus, changes in the liver were of a secondary functional nature, which is why the diagnosis and treatment caused difficulties. From the anamnesis it was found that the sharp manifestation of the disease was preceded by a conflict with the teacher, and the next day a sharp spasm of the vessels and bile ducts manifested itself with obstructive jaundice. After a consultation of doctors and in agreement with the head of the department, all allopathic drugs were canceled due to their ineffectiveness, and treatment was carried out using this BRT method. A medicinal preparation was made with the frequency characteristics of this patient, and was prescribed in a dose of 15 drops every hour for 3 days, then 10 drops five times a day until the recovery of bilirubin in the blood (control blood sampling once every three days), the dosage is selected individually, depending on the severity, chronicity of the process. After the first three days, the biochemical parameters of bilirubin decreased by 50 $\mu\text{mol} / \text{L}$ and the color of the skin began to recover, after two weeks the level of bilirubin and the color of the skin completely recovered. In medical practice, there is a pattern of paired severe cases, this patient is from this group. In the next ward with the same diagnosis with an unexplained etiology, there was another patient of the same age, only a bilirubin level of 270 $\mu\text{mol} / \text{L}$, but with a lethal outcome. After the first three days, the biochemical parameters of bilirubin decreased by 50 $\mu\text{mol} / \text{L}$ and the color of the skin began to recover, after two weeks the level of bilirubin and the color of the skin completely recovered. In medical practice, there is a pattern of paired severe cases, this patient is from this group. In the next ward with the same diagnosis with an unexplained etiology, there was another patient of the same age, only a bilirubin level of 270 $\mu\text{mol} / \text{L}$, but with a lethal outcome. After the first three days, the biochemical parameters of bilirubin decreased by 50 $\mu\text{mol} / \text{L}$ and the color of the skin began to recover, after two weeks the level of bilirubin and the color of the skin completely recovered. In medical practice, there is a pattern of paired severe cases, this patient is from this group. In the next ward with the same diagnosis with an unexplained etiology, there was another patient of the same age, only a bilirubin level of 270 $\mu\text{mol} / \text{L}$, but with a lethal outcome.

Example 2

Patient L.G.A., 53, two hours later due to stress at work, was hospitalized in the intensive care unit with a diagnosis of "ischemic stroke", at the time of hospitalization was recorded a complete cessation of breathing. The patient was on mechanical ventilation (artificial lung ventilation) for three days, during which the diagnosis of "ischemic stroke" was excluded after the examination of nuclear magnetic resonance imaging (nuclear magnetic resonance), due to the difficulty in verifying the diagnosis, apart from mechanical ventilation, no other treatment was prescribed. The day after the bioresorption

diagnostics using this technique, electroencephalography was carried out, which revealed a change in bioelectrical activity in the brain stem structures. However, the BRD revealed pronounced diffuse changes in bioelectrical activity not only in the brain stem structures, but also in the limbic structures of the brain - the hippocampus; a drug was made to these zones and prescribed according to the above method. Respiratory arrest occurred due to the cathode block of the pyramidal cells of the hippocampus, which, in turn, caused a blockage of the respiratory center in the brain stem structures, which led to a sharp bronchospasm and impaired breathing of the central genesis due to impaired conduction of impulses from the central parts of the brain to the peripheral part of the respiratory system. A week later, the patient is discharged in a satisfactory condition.

Example 3

Patient Ts.T.A., 52, After the murder of a 23-year-old daughter, a sharp deterioration in health, a month later diagnosed with thyrotoxicosis, heart rhythm disturbance (ECG data). She applied after half a year, since no improvement was noted against the background of the treatment, and an enlargement of the thyroid gland (confirmed by ultrasound) began, and frequent heart pains. The performed BRD revealed secondary diffuse changes in the thyroid gland, thyrotoxicosis, which provoked impaired conduction of the impulse along the cardiac conduction system with partial blockade of the left bundle branch and primary, formed by stress, a pronounced pathological zone in the hippocampus, which triggered the causal mechanism neuroendocrine disorders. The treatment was carried out according to the above method for one month only with a manufactured preparation. The criterion for the effectiveness of the treatment is the control diagnosis after the end of taking the drug after one or two weeks, if the frequency characteristics are not fully restored, then after a second examination, a new drug is recorded taking into account the changed indicators, as this patient was made twice. The repeated examination of the ultrasound of the thyroid gland and ECG were within normal limits, the general condition was satisfactory.

conclusions

Based on the experimental data obtained, the concept of "integrative, pacemaker role of the hippocampus in the formation of stress syndrome" is proposed, which allows explaining the diversity of clinical manifestations of stress, to develop new methods of prenosological diagnostics, etiological and pathogenetic therapy, prevention of manifestations of stress syndrome. Demonstrated a pronounced dependence of clinical the effectiveness of BRT of the proposed innovative method of biocorrection, from the concept. The advantage of the proposed method of bioresonance diagnostics and therapy is the possibility of prenosological diagnostics, eliminating the cause - the pacemaker focus in the hippocampus, the patient's own electromagnetic frequency characteristics, we

hinder development consequences - stress syndrome, restoring impaired functions until the body is fully recovered.

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E.V. Kudinova The concept of the "integrative, pacemaker role of the hippocampus in the formation of stress syndrome" and the dependence of the clinical effectiveness of BRT // XIII