Theoretical and experimental substantiation of the use of bioresonance therapy for the relief of alcohol withdrawal symptoms syndrome in patients with alcoholism

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Scientific discoveries of our time have made it possible to establish new causal explanations of life processes as a result of complex interrelationships between the functioning of the human body and the environment. Biological systems are energetically open and therefore can exchange energy and matter with the environment. This understanding has mobilized researchers to seek knowledge and methods to intelligently guide our lives.

The extensive literature on narcology provides detailed descriptions of clinical and psychopathological manifestations during the systematic use of alcoholic beverages, symptoms of damage to the main organs and systems during acute and chronic effects of ethanol on the body.

Much less work is devoted to questions studying pathogenetic mechanisms of metabolic and morphological disorders in alcoholism, at the cellular and molecular levels. The most successful of them were written by a team of authors: biologists, physiologists, and pharmacologists in collaboration with clinicians - toxicologists, narcologists, etc. [5, 6, 7].

At the moment, we have an insufficient amount of experimental data that allows us to put forward explanatory theories. Obviously, therefore, a combined approach is needed here, involving methods used in different fields of science.

In this report, the problem is considered from the physicochemical point of view, at the cellular and tissue levels.

The main effect of the action of alcohol is manifested, like inhalation anesthetics, in its ability to inhibit the function of the central nervous system (CNS), as well as to disorganize the functioning of the underlying parts of the nervous system.

In the ethanol molecule CH_2CH_2OH lacks isomeric carbon atoms, which gives it the ability to activate specific molecular targets.

The amphiphilic properties of ethyl alcohol allow it to dissolve in water and fats and, thus, disorganize the bilayer lipid membrane of nerve cells, which is accompanied by disruption of the normal function of specific neuronal systems (receptors, ion channels, enzymes). In nerve cells, ion channels are concentrated in the initial segment and axon and are responsible for a fast action potential that transmits a signal from the cell body to the nerve ending. There are many types

voltage-gated calcium and potassium channels on the neuron body and dendrites, which modulate the frequency of neuronal discharges much slower than sodium channels. For example, some types of potassium channels that open under the action of cell depolarization slow down further depolarization and inhibit the development of the action potential [6, 7].

It was found that ethanol does not bind to any specific receptors. He blocks potential-dependent channels, slows down release of neurotransmitters and violates postsynaptic reactivity with through interaction with membrane lipids and proteins. Neurotransmitter disorders in adrenergic, GABAergic, serotonin, dopamine-, endorphin receptor systems cause a variety of symptoms, both alcoholic intoxication and complications caused by intoxication. The adaptive reactions of the body to chronic alcoholism cause the formation of alcohol dependence. Development tolerance, related withdesensitization effect in synaptic receptors in the head of brain leads to abuse developing in alcohol. Withdrawal symptoms patients after cessation of alcohol consumption, manifests itself in a variety of physical and psychological disorders, causes an irresistible craving for alcohol and is accompanied by nausea, sweating, muscle tremors, smooth muscle spasm, anxiety, insomnia and other signs of a compensatory increase in CNS excitability as a reaction to alcohol withdrawal [5-7].

In the symptomatology of acute and chronic alcohol intoxication and the mechanisms of development of alcohol withdrawal syndrome (AAS), the key role is played by the consequences of the direct toxic effect on organs and tissues of ethyl alcohol and its main metabolites - acetaldehyde, acetate and alcoholic esters of fatty acids, as well as the body's adaptive reactions to intoxication and to stop taking alcohol.

The action of ethanol is accompanied by endogenous intoxication and causes unfavorable functional and structural disorders in most organs and systems. Freely penetrating to a wide variety of cells, ethanol has an effect on their plasma membranes. It easily penetrates into their lipid bilayer, binds to conglomerates of membrane lipids, “separates” the fatty acid chains of phospholipids, and increases the intramembrane spaces of the bilayer. One of the most important clinical consequences of this process is membrane dehydration, which occurs due to the displacement of water molecules that form the normal hydration shell of each of the membrane lipids [5, 7].

Ethyl alcohol is also capable of binding to phosphate groups of phospholipids and carboxyl groups of fatty acid chains. Ethanol molecules displace molecules of “bound” water from phospholipids of biological membranes and thereby disrupt the natural structure of the latter. However, unlike water, ethanol has only one hydroxyl (OH) group and is unable to form a bridge that binds molecules of neighboring lipids to each other. Ultimately, the matrix and transport functions of cell membranes are disrupted, especially the transmembrane transport of substances. And this leads to a violation of the coordination of the activity of cells in general.

Absorbed and distributed in the human body, ethyl alcohol changes the biochemical and electrolyte processes occurring in the microenvironment of cells, in particular, in the extracellular matrix, previously called the “basic substance”. Macroscopically, the extracellular matrix (ECM) is organized in the form of connective and supporting tissue, as well as blood. ECM components are secreted by the cells themselves and are filled with collagens,

glycoproteins and a gel formed by water and small protein molecules hydrated in it. From the point of view of molecular biology, we are talking about carbohydrate polymers, which in free form or in various forms of proteins and lipid compounds form an individual carbohydrate surface film of each cell. The intercellular substance, localized between the capillaries, nerve endings and the parenchyma, forms transport pathways through which all substances intended to enter the cell, as well as all decay products excreted from the cell, circulate [4, 11].

This system is one of the first targets for the action of ethyl alcohol. The main metabolites of ethyl alcohol, acetaldehyde and acetic acid, cause a decrease in pH and an accumulation of excess protons in the extracellular fluid. Local acidosis, leading to a change in electrostatic potential, can significantly alter the function of enzymes and hormones. Violation of the acidity of the medium and the electrical conductivity of the matrix also leads to an undesirable lengthening of the diffusion pathways through which nutrients enter the cell and degradation products are removed. Numerous pathological reactions arising from the action of ethyl alcohol lead to the accumulation of excessive amounts of free radicals, alcoholic esters of fatty acids, aggressive molecules of average molecular weight and other toxic substances. Getting into the blood lipid degradation products can alter the functions of various oxidoreductases, induce the activity of phosphotidylethanolamine methyltransferase, and serve as sources of endoperoxide formation, the harmful role of which in alcoholic illness has been convincingly proven in recent years. An excess of peroxides is found in serum with a simultaneous decrease in the amount of antioxidants, which aggravates the disturbance of intracellular equilibrium and a shift in the redox potential (ORP) of the matrix [5].

The details of the interaction of ethanol with components of the extracellular matrix (ECM) have been little studied, however, it is clear that at least ethyl alcohol can dissolve in extracellular water, disrupt its colloidal and conductive properties, and lead to a change in the composition of water sectors. Ethanol molecules compete with water for binding with various ECM constituents. This competition is based on the ability of ethanol and water to form hydrogen bonds; however, ethanol is an amphiphilic compound and, unlike water, it can simultaneously bind to hydrophilic and hydrophobic centers of the matrix. This leads to the displacement of water from the extracellular matrix, to a change in the conformational structure of molecules and weakens the adhesion of some specific substrates of ECM [5, 6].

H. Heine (1987) found microscopic holes in the superficial fascia at a depth of about 4 mm under the skin, through which the body is able to exchange energy with the external environment. Through these strictly limited fascial openings, localized in the projection of acupuncture points (AT), neurovascular bundles break through and affect the cylinder, consisting of ECM proteoglycans. Thus, the ECM substance is connected through the capillaries with the endocrine gland system, and through the nerve endings that release neurotransmitters into the intercellular substance, with the central nervous system.

Opening "Cylinder Heine " contributed to scientific justification the regulatory role of the acupuncture meridian system. If we talk about electropunctural diagnostics and the study of the functional state of the body, then the acupuncture point can be considered a “window into the regulatory system of the matrix”.

The accumulation of biologically active molecules in the microenvironment of cells is an organized system that plays the role of a cellular bioregulator and provides intercellular interactions of a short and long range of action. Due to their high ability to bind water and ion exchange, carbohydrate biopolymers are well suited for carrying and accumulating information in the matrix substance. Due to its
electrolability, proteoglycans react to any irritation by depolarization and can transmit it in the matrix to distant sites in the form of a chain reaction. Thus, the continuity of the transmission of primary information from the biologically active point (BAP) to distant parts of the body is ensured [10].

In this regard, mention should be made of the system of pyro- and piezoelectric circuits discovered by Atenstaedt (1974). According to this author, chains consisting of piezoelectric dipole molecules with the same polarity pass through the whole organism. These piezoelectric chain systems include, first of all, structural glycoproteins, individual molecules that are piezoelectric dipoles capable of vibrations due to their spiral structure [9].

Currently, benzodiazepines, barbiturates, GHB drugs, antipsychotics are widely used to stop AAS,
antidepressants; adrenergic blockers, vasodilators; infusion therapy and plasmapheresis. All these methods have a wide range of contraindications; are associated with a high risk of complications and side effects, the risk of developing cross-tolerance and the formation of drug
dependencies.

Unjustified use of alcohol-sensitizing drugs (disulfiram, cyanamide) at an early stage of AAS leads to an increase in intoxication, deterioration of acid-base balance (ACB) and electrolyte balance, which poses a serious threat to health. Thus, sometimes there is a paradoxical situation when abstinence in alcoholic patients "goes away" much faster if it is not treated.

Considering the above data on the effect of ethanol on body systems, and functional the multifactorial nature of the mechanism, it is difficult to development of AAS, not understand why drug therapy of withdrawal symptoms states often leads to unpredictable consequences. Psychotropic drugs and detoxification agents injected into the body increase the degree of uncertainty in the system. Sometimes, contrary to the expectations of the doctor, the patient, for example, develops a state of inhibition, but the pathological craving for alcohol is never removed.

The ongoing changes can be viewed in terms of the relationship between biophysics and biochemistry. Any chemical action leads to a change in the potential of cell membranes and displacements of charges in the matrix, thus changing its functional state. And vice versa,

any external electrical stimulation is accompanied by metabolic changes that change the direction of the dipole molecules, the polarization of which, in turn, causes local potential shifts. Depolarization of loose connective tissue leads to changes in the colloidal structure of the ECM intercellular fluid in the direction from the state of solution (sol) to a less fluid state (gel), etc. From this point of view, most of chemistry can be safely reduced to physics.

Along with such electrophysiological methods as EEG, ECG, EMG, in recent decades, measurements of BAS of the skin have been carried out using the method of bioelectronic segmental functional diagnostics. Several diagnostic methods have also been proposed for determining the functional state of an organism based on the results of measuring BAP. They help to choose the most optimal variant of electropuncture or electromagnetic influence, including BRT.

According to the authors, biophysical methods for correcting disorders in patients turned out to be no less effective than the methods of pharmacotherapy of alcohol withdrawal syndrome generally accepted in drug addiction practice. BRT, carried out at the earliest stages of the development of AAS, allows you to quickly reduce the dosage of psychopharmacological drugs, up to their complete cancellation, and in most patients it allows you to effectively stop the symptoms of AAS without the use of medications, by stimulating the body's own adaptive capabilities [1, 8].

In 2003, on the basis of the Department of Psychotherapy and Narcology of the Faculty of Advanced Studies of the RUDN University, 78 outpatients with chronic alcoholism of the II stage were observed at the age from 26 to 53 years (all men). The aim of the research was to test the effectiveness of the use of the BRT method, as a monotherapy (without the use of pharmacological drugs), for the relief of AAS in patients with alcoholism.

The patients were examined by a clinical method and with the help of electropuncture diagnostics. Patients were selected without concomitant comorbid mental pathology, the consequences of organic damage to the central nervous system, and a history of alcoholic psychoses. The duration of the existence of alcohol withdrawal syndrome did not exceed on average
8.6 years. The development of alcoholism was mainly of low-grade and medium-grade character. The average daily alcohol tolerance was 0.84 liters of vodka. The study did not include patients who were intoxicated, as well as those who had more than 48 hours since the last drinking.

Before the treatment sessions, the patients underwent bioelectronic segmental functional diagnostics, diagnostics according to R. Voll and ART. BRT was performed daily along all acupuncture meridians, according to 1 or 4 strategies, since in the overwhelming number of patients, when diagnosed by R. Voll's method, significant deviations from the norm were recorded on most meridians. Hand, foot and frontal electrodes were used for therapy. The duration of the therapy session was usually 20-30 minutes. The therapy was completed when the indices at the points of measurement (TI) according to R. Voll's method reached 50–65 conventional units, and there was no “drop of the arrow” on the scale of the device. In the intervals between treatment sessions, the patient

a general “BR-drug” recorded in the course of BRT was prescribed (1–4 globules - sublingually). The average duration of the course of treatment was 3-5 days and did not exceed 8 days.

Against the background of BRT in 32 patients (41%), psychopathological, somatic and autonomic manifestations of AAS were completely reduced; 27 patients (34.6%) noted a marked decrease in the severity of withdrawal symptoms and a decrease in its duration, compared with the usual; 12 people (15.4%) voluntarily interrupted treatment after the 1st or 2nd procedure and disappeared without explaining the reason; 7 people (9%) resumed drinking alcohol during treatment, citing the ineffectiveness of therapy.

Evaluation of the dynamics of indicators on (TI) meridians by the method of EAF diagnostics, with repeated measurements and at the end of the course of treatment, revealed an improvement in indicators on most meridians.

The results of studies on the use of BRT for the relief of AAS presented here are fragmentary. Other aspects of complex diagnostics and therapy of patients with alcoholism are beyond the scope of this theoretical work and will be presented in a separate message.

A thorough analysis of modern BRT problems shows that the greatest preference when working with patients with alcoholism should be given to the variants of the method based on the choice of the frequency regime and the form of the therapeutic signal, obtained by the method of resonance scanning from the BAZ of the patient's skin, using feedback. BRT variants are also preferred, in which the shape of the therapeutic signal corresponds to the electrical activity of the main brain rhythms, or to the frequency characteristics of other interested functional systems in the normal (physiological) state of the body [3].

The developed versions of BRT are based on the effects of weak electromagnetic fields with certain characteristics that resonate with wave processes in the organs and tissues of the body. Various BRT options implemented in devices developed and manufactured by the IMEDIS Center differ from each other in frequency characteristics, signal shape and approaches to their purpose. The main factors for successful bioresonance diagnostics and therapy are the normalization of the electrical activity of the brain and overcoming metabolic and energy problems localized in the extracellular matrix. Combined BRT, which is, in fact, the simultaneous conduct of exogenous and endogenous

BRT significantly increases the effectiveness of therapy, taking into account the fortunes patient [2].

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