

Analysis of the Factors of Optimality in Electro- and Electromagnetic Therapy
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Since the second half of the 20th century, traditional acupuncture has gradually transformed into a wide variety of reflexology methods using advanced technologies based on modern concepts of integrative medicine and rational therapy. Currently, there is an active introduction into medical practice of new hardware, methods of electropuncture diagnostics and therapy, including the use of therapeutic factors of low intensity (LFMI) [2]. Over the past several decades, as a result of the rapid development of electronic and computer technologies, new and improved previously implemented hardware and software complexes (APC) have been developed, which have made it possible to significantly optimize the performance of traditional diagnostics and electromagnetic therapeutic effects. Therefore, there is a need to generalize the main approaches to the optimization of electro- and electromagnetic effects for diagnostic and therapeutic purposes. The principles of optimal physiotherapy, first introduced by V.S. Ulashchik (1980) [8].

1. Dynamics of action

The efficiency of the dynamic (moving) impact is dictated by the general principles of functioning of almost all biosystems. In the course of the evolutionary transition from a single-celled to a multicellular organism, mechanisms were formed that ensure the interaction of cells and intercellular information exchange. These processes involve growth factors, hormones, eicosanoids and neurohormones, as well as other signaling molecules. Due to this, living systems are constantly in a dynamic state due to continuous homeostatic correction.

By now it has accumulated a big amount of experimental and clinical studies confirming the relationship of the rhythms of physiological processes in organisms with various helio-geophysical factors, the influence of the Moon and planets and periodic changes in the geomagnetic field [3, 4]. The very organization of a living system is formed in the "field" of the influence of the external environment, and therefore any physiological activity of living organisms is accompanied by dynamic interaction with environment, including material-energy exchange and information communications. The functional systems involved in the regulation of homeostasis use specific adaptation mechanisms in relation to a variety of environmental influences. To the action of dynamic electro- and electromagnetic fields, addiction develops much less frequently and more slowly, therefore, the effects may be of lesser intensity and duration, which increases the tolerance and safety of medical procedures [5]. This can also be attributed to the options for the modern implementation of the known methods of labile reflexology along with the traditional ones: superficial acupuncture, scraping and cupping massage, pinch

spine therapy, etc.

2. Resonance of action

The human body is a complex physical and chemical system. Cells and tissues exhibit spontaneous electrical activity. The phenomenon of cellular electrogenesis, i.e. generation of electrical impulses is provided by short-term changes in the membrane potential. Short-term electrical activity is associated with a change in the ionic permeability of the cell membrane, the gradient of ion concentrations and the resting potential. This electrical activity forms the basis for the perception of stimuli by specialized receptor cells and the propagation of excitation.

Many interactions in the body, as well as the control processes in them, are frequency-dependent in the form of a resonant response. Resonant effects can manifest themselves in the whole organism at the levels of individual organs and systems, at the cellular and subcellular levels. An important role in the phenomenon of resonance is played by the presence of feedback systems and channels for transmitting information within the body. The current in the body during the generation of biopotentials of organs and tissues, according to existing data, passes mainly through the intercellular spaces, as well as through the tissue fluid. The frequency spectra of the bioelectric activity of individual organs can be determined by recording potentials at two points in the body, using biopotentialography or electrography. A number of authors offer universal frequencies with the highest biological activity: 1 ... 1, the rhythm of heart contractions and 8 ... 12 Hz - alpha rate electroencephalograms of the brain.

The development of pathological processes in bodies and tissues leads to changes in the passive electrical properties of individual parts of the body. The study of such changes can be used to diagnose various diseases. For example, the inflammatory process is accompanied by an influx of blood with significant electrical conductivity. Necrotic processes lead to a violation of the cellular structure of tissues, as a result of which the pathological focus has a reduced electrical conductivity. Plasma membranes lose their barrier properties. This leads to a change in the capacitive properties of the tissue and, as a consequence, to a change in its reactance. Therefore, examining separately the voltage drop across the active and reactive resistance of the tissue, one can draw conclusions about the nature of the pathology.

With the introduction of pathogenic pathogens and the development of the disease, new sources of pathological electromagnetic oscillations are formed in the body - the so-called disharmonic oscillations, which disrupt the physiological regulation system.

There are multiple resonant structures in the body, and the frequency spectra to which the body responds correspond to the resonant frequencies of these structures. By testing patients by the ART method using various test indicators of pathological processes and frequency rhythms of the brain, we significantly increase the accuracy of measurements, and, consequently, the selection of appropriate therapy in conditions of polyfactorial exposure and polymorphism of the course of the disease. [one].

In the process of bioresonance therapy, it is possible to select the frequency spectra of pathological and physiological oscillations, separate and, if necessary, invert them. Algorithms and modes of BRT are selected based on the results of clinical examinations and electropuncture diagnostics.

The method of exogenous BRT using resonant frequencies is based on frequency interactions between electromagnetic oscillations supplied from the outside and oscillations of individual organs and systems of the human body.

As practice shows, any physical effect is better absorbed by the body if its frequency parameters coincide or are close to the frequencies of functioning of a particular body system.

3. Combination of impact

It has been proven that various physical factors can potentiate each other and give the resulting effect significantly higher than their separate use [7]. An example where the choice of the optimal treatment largely depends on the correct recognition of the general "image" of the disease is inflammatory diseases of the joints. There are still no specific treatments for rheumatoid arthritis. Given that the disease is accompanied by chronic pain and functional impairment, reflexology methods play an essential role in the rehabilitation of patients and in the fight against pain. In some cases, the combined and / or combined use of pain suppression methods such as acupuncture, transcutaneous electrical stimulation, magnetic laser, resonance frequency and electromagnetic interference therapy has a positive effect. There is also an anti-inflammatory and general sedative effect, which reduces the manifestation of psychological stress in patients. A number of publications report the successful results of the combined use of herbal medicine, homeopathy and hirudotherapy. Drug therapy is rarely used in isolation; it should be used in combination with the above methods. Optimization of therapeutic effects requires great skill and ingenuity in the choice of one or another variant of combination therapy.

Electric and electromagnetic fields, acoustic vibrations, coherent radiation of the optical spectrum, thermal and other radiation can be used as energy-informational external influences. In cases where endogenous bioresonance therapy is not enough, exogenous factors are additionally introduced into the external control loop - nosodes, organopreparations, homeopathic and allopathic drugs, allergens, minerals, trace elements, etc. In this case, electromagnetic oscillations of the body, its organs, systems, etc. ... synchronized and corrected by the specific oscillation frequencies of the above factors in order to increase the effectiveness of therapy.

Thus, the main task in the treatment of various diseases is to eliminate the underlying pathological systemic disorders, while treatment aimed only at normalizing the functions of the target organ is symptomatic therapy. This approach is effective for stopping functional disorders of the organ, but, as a rule, does not provide complete recovery. Complex

pathogenetic therapy of LFMI in the form of a combined effect on the interrelated links of the pathological process will lead to a more significant effect due to the potentiation of the methods and drugs used. This will increase the therapeutic index of therapy and reduce the likelihood of complications.

4. Multi-zone impact

Electric and electromagnetic influence will be more effective if the same painful symptom or syndrome is affected from different reflexogenic zones or through different functional systems of the body. As established in our studies, the severity of reflex analgesia depends both on the points of exposure and on the frequency of electroacupuncture (EAP) stimulation [6]. The greatest effect is observed with simultaneous EAP stimulation both at points (locally segmental action) located as close as possible to the source of pain stimulation, and points of general action. This is consistent with experimental data. Therefore, we can assume that the formation of the analgesic effects of acupuncture and its modern modifications is carried out by a complex of neurophysiological and neurochemical mechanisms with selective and dynamically changing functional structure. Selective and optimal activation of these mechanisms depends both on the nature of the impact (combination of acupuncture points and the parameters of their stimulation), and on the initial functional state of the brain structures that receive afferent signals. For these purposes, multichannel power generators are required with independent adjustment of exposure modes through the output channels.

According to modern concepts, the optimal one is that physical therapy in which two or more conditions of optimality are fulfilled. In conclusion, it should be recognized that adaptive bioresonance and multiresonant therapy in complete least corresponds to conditions optimality of therapeutic physical effects.

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