

Pogledi/Views

MICROWAVE RESONANCE
THERAPY*

MIKROTALASNA REZONANTNA
TERAPIJA*

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Ključne reči

kvantna medicina, mikrotalasna rezonant-
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Abstract

The usage of athermic, low-intensity electromagnetic waves of extremely high frequency microwave range (EM MW) is a biomedical novelty in quantum medicine. Microwave resonance therapy (MRT) is based on the Russian-Ukrainian concept on quantum nature of acupuncture system, as a dynamic structure joined at the locations of the maximum of de Broglie's interferential three-dimensional standing waves. The changes in dielectric properties of tissues lead to a disease, deforming the structure of the EM MW standing waves and related acupuncture system. Microwave resonance therapy (of extremely high frequency 42-100 GHz, athermic energy 10^{-4} eV and extremely low intensity 10^{-21} W/Hz cm^2) resonantly normalizes frequency responses in excited acupuncture system and an organism biochemically overcomes a disease via physiological-neurohumoral MW and self-regulatory acupuncture mechanisms. This paper shows biophysical basics of microwave resonance therapy, methodology, similarities, differences and novelties in current Russian and Ukrainian technologies, as well as results of microwave resonance therapy application in own practice, which confirm high effectiveness of this approach.

1. INTRODUCTION

In the second part of the 20th century it was discovered that the *human body has its own, characteristic frequency (f) of the electromagnetic field (EMF) in the microwave range (30-300 GHz), as well as that the organism itself is capable of detecting as much as 0.01% disturbed frequency of the stable EMF. The application of low intensity EMF MW of spectral density 10^{-21} W/Hz cm^2 , frequency range of 30-300 GHz and wavelength range of 1-10 mm, in the biomedicine*

is a new trend, originating from the former SSSR, from the middle of 1960ies [1-7].

What is important for quantum mechanics is not only the microscopic dimensions, as it can also be applied to macroscopic sizes. An absolutely essential condition for the quantum mechanics application is the very existence of the organic self-preservation potential in the system. These potentials determine the existence of an object on certain levels of the quantum scales. The formation of the organic macroscopic quantum mechanic entity is determined by the exis-

tence of the efficient and far reaching active forces in a limited frequency range, which create coherent laser-type fields in every entity and can be found in living systems, too. Even as early as 1972, Weisskopf anticipated the fourth stage of self-organization of the substance with the special energetic levels, but he left the presentment without the comment. Weisskopf was the first to realize that only principles of quantum mechanics, the principles of identity and continuity alongside with existence of the characteristic related frequencies, enable three individualistic world stabilities on three substance self-organization levels: a nuclear, atomic and a molecular one. It became clear to Weisskopf that the nature, apart from these three, knows at least one more level of the substance self-organization, that is the fourth level of the substance self-organization in the nature, upon which exist living creatures [1-17].

It is possible, through the principles of quantum mechanics and quantum medicine, to reach a scientific understanding of many diagnostic-therapeutic methods typical of the traditional medicine. Also, homeopathy got its scientific recognition only after the development of the device originating from the quantum physics domain, which enabled us to monitor the subtle energetic ultralow dilution levels of 10-24 mmol/l. For checking homeopathy preparations, an information energetic methodology has been proposed: laser spectroscopy and nuclear magnetic resonance (NMR). The explorations done with the laser photo dispersion have confirmed the difference between homeopathy preparations and the distilled water, while when they were done with the aid of NMR, the studies of the homeopathy preparations, of various potentials, showed the difference in the time of the transversal proton relaxation, contrary to the placebo, that is the distilled water.

Quantum medicine utilizes low energy, safe electromagnetic emissions (EME), that have beneficial effects on intra and intercellular processes [8-18].

Microwave resonance therapy - MRT (Extremely high frequency radiation - EHF, Microwave millimeter-range radiation) utilizes frequencies of 42-160 GHz. MRT is most frequently employed via biologically most active points - BATs (acupuncture points - APs) and biologically active zones - BAZs.

MRT inventors are scientists from the former SSSR: Andreev, Beli, Sit'ko and coworkers from Kiev; Deviatkov and coworkers from Moscow; Zalubovskaya, Cherkasov and Nedzvetsky from Harkow; Tkachenko and coworkers from Nizhny Novgorod; Kozhemyakin and coworkers from Tomsk; along with the great contribution of Zhukovsky, Besonov, Golant, Temuryanc, Macheret, Lebedeva, Betsky, Zaporozhan, Kuz'menko, Rodschtadt, Grubnik, Kovalenko, and many more. Some analogue research was conducted by Webb in Canada, and Gründler and Keilmann in Germany [1-17,19,20]. The assumption from 1980ies that *the acupuncture system (AS) is a dynamic structure differentiated on the points of the maximum of the tri-*

dimensional standing waves, formed as a result of the reflection of coherent microwave Fröhlich excitations of the molecular cellular membrane and protein's subunits, was encouraged by some other researchers pointing out that differentiation of the intercellular ionic gap junction channels, whose density was greater on the spots of acupunctural meridians (AMs) and APs, was slightly sensitive to the EMF changes, too [1-17,21-26].

This new scientific approach has undergone several developmental procedures and got confirmations, from preclinical research program (1964-1978), animal experiments and clinical application with the statistic monitoring of the results obtained (since 1978). As of mid 1980ies devices with extremely high frequencies have been developed. At the forefront of this developmental process are the centers in Kiev, Moscow, Tomsk, and Nizhny Novgorod.

Weak electromagnetic waves (EW) play an important role in the correlative relationship of an organism with its environment, as well as in the functioning of all living creatures. The fact that there is an interaction between the surrounding objects from our environment and the human organism has also been in the focus of Sit'ko's scientific team's interest (Sit'ko, NIC Kiev, Ukraine), the team that conducted measurements of various natural and synthetic substances from our environment, scaling their relationship with the human organism.

2. Biophysical Mechanisms of Acupuncture Regulation

When the fundamental science about "the alive" started to take form and the clinical results of its application became apparent, it meant the beginning of understanding AS through quantum-mechanic approach. According to this theory *the systems of Chinese AMs also have an electromagnetic nature*.

AMs form in the 14th week of the embryo development, at which time papillary lines get also shape. At that time cartilage tissue turns into the bone, which, from the "the alive" perspective, means the possibility for EW reflection ("the reflecting wave") from the bones and the skin and the formation of the meridian system. Stability maintenance of the organism's coherent field is enabled by the condition of EW falling inside onto the skin cover into BATs, under the angle which is right or greater than the angle of the full internal reflection. *The skin breaking angle in APs areas differ from the breaking angle on the other points, likewise EW of the right-hand side or left-hand side polarization* [1-7].

The physics of "the alive" makes it possible to grasp the mystique "vital energy" (qi, ki, prana, pnevma), that forms the basis of the traditional medicine, through ASs with the classic ionic and quantum solitonic nature (wave-particle dual nature).

Qi has its own interpretation in the ionic currents and the corresponding EMF with the informative contents encoded in space-time transmissions of the acupuncture ionic currents and corresponding MW and extremely-low frequency (*ultra-low frequency* - ULF) of EMF. In this way, it is possible to identify the ionic and the quantum-solitonic nature of AS. *Ionic acupuncture currents and corresponding EMF have two resonating windows: (extremely-low) ULF and (extremely-high) MW components*, taking into consideration that a very fast MW component is modulated in its amplitude characteristic by a substantially slower ULF component, which enables the opening of the windows in the tissue interactions with a weak EMF. The proof for ULF nature of the ionic currents of the acupunctural channel lies in the resonant ULF stimulation of the acupunctural system in the conditions of the endorphin analgesia (~4 Hz), serotonin and/or norepinephrine (~200 Hz) mechanisms, as well as in the efficiency of the bioresonance therapy (BRT). On the other hand, the proof for MW component of the ionic acupuncture currents can be found in an efficient application of MRT (30-300 GHz) [1-17,21-26].

Sit'ko and coworkers presented the "quantum physics of the alive", based on AS as a dynamic structure associated on the locations of the maximum of de Broglie's interferential three-dimensional standing waves, which resulted in the reflections, from the skin and bones, of nonlinear coherent EM MW (Fröhlich's) excitations of highly polarized molecular subunits in cellular membranes and cytoplasmic proteins. This was shown by some other researchers who pointed out that formation of the gap junction channels in AP and AM was involved in the activation process of the channel opening, as well as in the association of the connexons semi-channels, or even in the creation of the connexons monomers. All this results in changing the membrane priority and polarity, which can be stimulated by space-time maximal MW ranges of the organism's EMF (by altering voltage sensibility in the gap junction channels' conductivity). In that context, the explanation for the efficiency of MRT (the leading quantum-medicine method), as an noninvasive biomedical treatment, should be sought in the following: certain organism's dysfunctions, connected with the local alterations in the dielectric characteristics of the tissue and organs, lead to an increase in deformity of the structure of the standing waves of the electric organism's MW EMF, which affects certain changes in the time-space AS structures and, secondly, the AM's resonant frequencies, which generate the onset of an illness [1-17,21-26].

According to the Sit'ko's group's concept, AM trajectories are reflexed on the points of EMF MW movement in the human organism, which makes it *possible to find the connection between the characteristics*

of the bordering cycles and balanced structures within the coherent EMF MW organism's range and the topology's regularity of the classical acupuncture meridians. The appearance of the bordering cycles is associated with the generation of a resonant and discrete emission in the system of "the filling active cellular systems - linear absorbing environments". The emergence of AM can be considered as a phase transmission. EM body network was examined by both Sit'ko and Tzvily. Their basic assumption was that *the discharge complexes, which appear in the source of a coherent MW EMF, get connected with the cell's membrane if frequency vibrations of the cell's membrane are placed in the millimeter range (mm) EM spectrum.* The pressure's greatness or pressure complexes, connected with the membrane, can be seen as a thermodynamic parameter, which the neighboring membranes' vibrations start with, so that the internal states of discharge complexes become synchronized, which leads towards a significant modification of that thermodynamic indicator of the physical environments, enabling a dialectical penetrability to occur. It is through the discharge complexes connected with the cell's membrane, formed alongside the meridian, that the actual place of AM in the organism is being determined. *Formed AM have the character of phase transmission of the second order.* Phase transmission can be understood as the development of the thermodynamic parameters' unstable fluctuations, limited by nonlinear character of the interactive environmental units. Interactive units are represented by the cell's membrane discharge complex, which represents the factor of meridians' creation and contributes to the transition into the final thermodynamic state. EMF parameters, that form an interactive force of the neighboring cells' membrane potential, establish the correlation between their vibrations and the inner environment, through connected discharge complexes, characteristic of the temporal existence.

Therapeutic effect through excited AMs happens as a result of summing of the external EMF's quanta, of spectral density 10^{-21} W/Hz cm², which shows that the discharge alterations represent the source of a coherent EMF of the quantum mechanical character. The energy migration alongside AMs corresponds to the description of photoexcitons, having a character of quasiparticles (alongside with the existing quantum mechanical wave-particle dualism), so that AMs creation acquires a quantum mechanical interpretation as a birth of the new phase - photoexcitons [1-7].

Phase transitions lead to changes of the physical systems, so the meridians' *geometry differs from the local geometry of the other human body's areas.* *The kinetics of the examining phase transition can be perceived as a spontaneously changed dynamic symmetry, which accounts for the photoexciton's course of movement alongside the meridian* [1-7].

The model of AMs formation as a phase transition of the second order, described as a wave function of the coherent state, makes it possible, in the linear approximate diameter, to evaluate the flow of AMs which is regarded as a streamed EM MW system of the wave-conductive type. EMW, spreading across a streamed system, possesses a quantum mechanical wave-particle dualism, and can be connected with the choice (though a possibly incomplete one) of the quantum quasiparticles - photoexcitons [1-7].

This is how a dual nature of AMs could be described: an *ionic* and an *electromagnetic-solitonic* one. APs represent a wave leads for the entrance of the external photons within EMF MW range. A resonant therapeutic activity of the quantum of EMF MW external source can be interpreted as a resonant "springing up" through the barriers of the external photons within MW range. EMF MW dissemination across a dielectric wave lead falls exponentially with the distancing from the wave lead's axis, which can be seen when EMW exists out of the cylindrical wave lead [1-17,21-26].

A dispersive interaction between energy and the projection of photoexcitons' pulses onto the AMs axes can be interpreted as a fixation of other quantum "quasi particles" in a dispersive interaction of a possible wave type in a wave lead's management system with a certain dielectric penetrations' tensor, which, together with the magnetic penetrability's tensor, determines an index of the environments' breaking angle, with a given frequency of the external EMF for the waves within MW range. *A quantum mechanical quality can be explained as a transient layer between the coherent EMF components and the absence of a non-coherent field within the meridian's circumference* [1-7].

According to this model, the mechanism of AMs formation is universal for the organism and is not connected with certain cytomorphological characteristics, which helps the organism to form a stationary, as well as a "time meridian"-wandering, unstable and a "wondrous meridian". This enables us to understand the organism's non-stationary EM network within the borders of the conception of the whole organism's self-regulatory potential and suggests researching unstable or "wondrous meridians", as a time-related formed EM structure of the organism, of the bordering cycle's type [1-7].

Sit'ko's group's experimental research has shown that the skin's breaking angle in the APs areas differs from a breaking angle on the other points, which is similar to the changes that occur in EMW of the left-hand side and right-hand side polarized points, irrespective of the fact that it is also the characteristics of other points of the skin [1-7].

The research with some other kinds of AM technologies can possibly harm a coherent state in the meridian's depth because of the external influences

that lead to the occurrence of thermodynamic processes, because of the greater intensity of their parameters of influence on the meridian. Exploring AMs with the external influence of the resonant EMF of low, athermic intensity, induces a phase transition from a metastable thermodynamic state and has the character of a macroscopic coherent state's formation. The research induced by a phase transition of the external EMW within MW range, can be applied to the results analysis and the explanation of the alteration of the form of EMW therapeutic activity's resonant surface.

Dynamic, coherent EMW is formed in a non-linear environment of the human organism, spreading to its other parts, in interaction with certain regulations of the non-linear optics for the resonator filled with the non-linear absorption of the environment with active centers. The analysis of APs alongside external meridian trajectories has confirmed this assumption, in accordance with the principles of minimal loss of the wavelength that falls upon the skin surface from the inner side, under the angle not smaller than the angle of the full inner reflection for the environment in question. The ratio of the meridian's lateral section is determined by the conditions of the existing environment alongside AMs trajectory, and is, in most cases, correctly formed as a result of the EMW reflection from the fingernails and toes. This research known as *Rudjenko effect* (1997) has shown EM nature of Chinese AMs. In order to satisfy the measurement conditions which would not deteriorate AMs integrity by heat emissions (as a receiver it cannot absorb heat emission that occurs at that temperature, nor as the source it cannot emit such an emission), it was arrived at the following solution: to decrease the receiver's temperature up to the point of its own noise (that could be found below the emission level, in mm, "trail" of the Planckian distribution). The first version of the developed radiometric systems had a level of its own noise of $4 \cdot 10^{-3}$ W/Hz cm², that is not very much below the level of a thermal balanced emission, while, in NIC "Vidhuk" in Kiev, an innovative solution has currently been employed, devised by a group of scientists led by Skripnik and Yanenko. They have constructed a radiometric device of the new generation, that emits a level of its own noise within the frequency range of 53-78 GHz within the scale of $5 \cdot 10^{-23}$ W/Hz cm², which means that the noise level has been decreased greatly and that it is now possible to obtain significant results [1-7].

3. Biophysical and Technical Aspects of Microwave Resonance Therapy

At the onset of an illness (a meta-stable state, according to Sit'ko), there is the information about the illness, which was however preceded by the information about the healthy state (except for the genetically

preconditioned illnesses and disorders), as well as existing self-organizational and self-regulatory processes that, in every moment of our lives, with the aid of several billion perfectly composed biochemical reactions, keep under control our health, by basically following the pattern that was encoded and that in every moment, absolutely precisely, supervises and surveys every process and holds back every intention towards losing control, reintroducing the state of a controlled, self-organizational processes, by establishing EM network of the body.

According to Sit'ko, from a quantum mechanical point of view, it could be said that *EF within mm range reflects the existence of the macroscopic self-regulatory potential of Landau-Haken type*, cf. Fig. 1, while, with the application of nonlinear thermodynamics and synergic interpretations, it is being said, they represent a spatial projection of six even (on the plane phase) bordering cycles [1-7].

Regardless of good clinical results obtained from the application of AMs MRT stimulation methods, biological mechanisms of influence still lie within the domain of theoretical assumptions:

- The interaction of MW with watery and biological environments, through the water cluster.
- Through the microtubules' role, which represent a kind of a wave lead for MW.

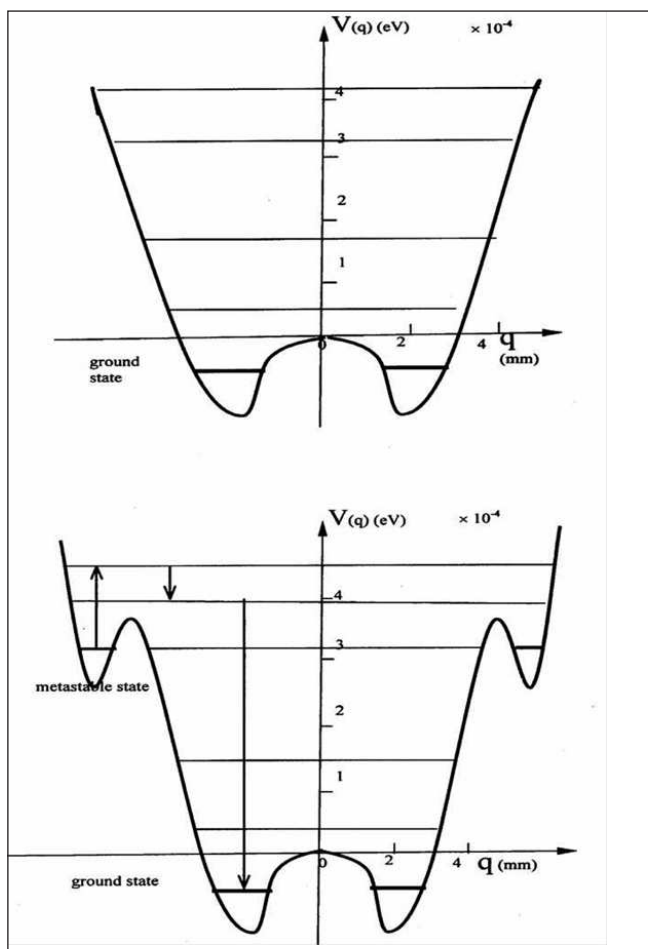


Figure 1. Landau-Haken potentials [1-7]; health as a basic organism's state (above), and illness as a meta-stable organism's state (below).

- Inducing mechanical resonances through piezoelectric skin structures in APs zones.
- Through the role of protein molecule in EMF MW diapason transmission.
- Through the effect of EMF MW diapason it has on the membrane's receiving systems.
- Through the role of *AS as a quantum self-regulatory system*, which would be a crucial explanation. The first five mechanisms could be seen only in the light of the *starting AS activations as a quantum coherent self-regulatory system*.

For a single dosage of MRT stimulation, Sit'ko's group proposed monitoring the level of mitochondrial enzyme, dehydrogenase succinate (SDH), which can be seen microscopically, in the lymphocytes of the blood periphery, because the lymphocytes' metabolism can be used an illness index. Lymphocytes' system "remembers" earlier health states and stores the information about the illness, trying to bring the organism back into the former healthy state.

4. Medical Aspects of MRT

Quantum medicine and MRT as its representative, have the character of holistic medicine, because they solve a series of problems that accompany the basic problem both individually and on the level of the whole organism. MRT, as one of the most representative quantum medicine technologies [1-17,19,20,27-29], facilitates:

- Registration of the temperature range, by measuring both integral and spectral densities;
- Determination of the source of thermo-diversity in the organism;
- Registration of the influence of physical and chemical factors on bio-objects' temperature fields and establishing the relationship between electromagnetic EMF parameters and bio-objects' physiological parameters, with correction of the process of healing by physical and chemical methods according to changes of the parameters of bio-objects' EMF;
- Organism's ability to choose a necessary resonant frequency; The resonant quantum-therapeutic action of the external EMF source can be interpreted as a resonant "springing up" through the barriers within the external EMF MW range;
- According to the results of experimental parameters, the MW range emissions are informative enough; moreover, they correlate with the biophysical parameters and the physical state of the human organism and can be employed in the diagnostics of various illnesses;
- MRT works with intensities commensurate to the coherent field of human organism in MW range, located on the quantum level of fundamental organism's characteristics, in the range from 10^{-22} to 10^{-11} W/Hz cm^2 ; The intensity of the emitted therapeutic

signal is located far below sanitary allowed levels, according to the standards adopted by modern medicine;

- *Therapeutic effect* occurs as a result of summing up the external quantum EMF (efficacy's intensity of 10^{-21} W/Hz cm^2), which implies that the discharge changes represent the source of a coherent EMF and have a quantum-mechanical character;

- *Existence of a resonant, sensor organism's response* to small changes of external MW frequency (0,01-0,1%); MRT effect means that EMF MW within the range of MW generator makes corrections of EMF MW within an ill organism's range, alongside with prompting self-regulatory recovery mechanisms;

- *MRT is possible to use narrow and wide spectrum generators* of MW emissions; The narrow spectrum generators emit a manually or automatically chosen frequency, based on the local, sensory organism's response; Wide spectrum generators emit a whole EMF MW frequency spectrum ranging from 42-100 GHz, while the organism chooses its own frequency; Here are the devices with the regime of "svepirovani-je", which shift through all frequencies in just a second's fraction; CEM®Tech devices have a characteristic FRI regime (they register and reemit a background EMF emission, which aligns it with the bio-resonant methods);

- *Resonant, non-dissipative, informative effect* (showing that AS is a macroscopic, quantum-holographic, MW informative network, ULF modulated, with the memory "attractors" that store individual states of psychosomatic health and various organism's disorders [1-7,21-26]);

- *Discharge complexes, that occur as a source of a coherent MW EMF*, connected with the cell's membrane, if frequency vibrations of the cell's membrane are within MW EM spectrum's range;

- *Energy migration alongside the meridian corresponding to photoexciton's notion* (having a character of quasi particle, with the existing quantum-mechanical wave-particle dualism), and *the meridian origination getting a quantum-mechanical interpretation as the birth of a new photoexciton's phase*;

- *Low intensity* (up to 10^{-22} W/Hz cm^2) and low energy (up to 10^{-4} eV) of a biologically efficient MW radiation far below a thermal effect and the absence of adverse effects of MRT, as a highly safe biophysical healing method;

- *Negligible MW energy losses* across significant lengths alongside acupuncture meridian (~1 m) from an exposed acupuncture point;

- *Biophysical possibility to establish an EM homeostasis*: low intensity EMF of the signal within MW range enables a renewal of EM network through which it is possible to stabilize all systems of organism's vital functions as well as biochemical processes that get adjusted to EM network;

- *Non-medicament prompting of self-regulatory mechanisms* for getting over an illness and reaching recovery;

- *Absence of adverse effects of MRT*, as a highly safe biophysical way of healing;

- *Non-invasive, non-contact method* (although a contact with the skin can be made, without the skin surface's icing), which rules out the possibility of infectious diseases' transmission from a patient to a patient (like hepatitis B, AIDS...);

- *Possibility to put MRT to diagnostic, therapeutic and rehabilitation purposes*;

- *High efficiency* (it shortens the healing period as much as 1.5 or 2 times, compared to some other healing methods) and *high economy* (sick leaves are reduced and the usage of pharmaceuticals get reduced or even eliminated) in healing;

- *Compared to classical acupuncture* comparative statistics show a greater efficiency of MRT (82% in chronic, up to 100% in acute cases, while with acupuncture these results are 65-72%).

MRT is employed in healing of many illnesses in: cardiology, pulmonology, neurology, psychiatry and the addiction, gastroenterology, gynecology, dermatology, pediatrics, immunology, orthopedics, traumatology, surgery (pre and post operational), and oncology [1-17,19,20,27-29].

While there are no serious contraindications for the employment of MRT, those considered relevant are the following: acute pain in abdomen that requires an urgent surgical intervention, pregnancy (because there have been no studies for this category), and pacemaker.

MRT can be employed in hospitals, as well as in ambulance conditions, spas and sanatoriums, as an independent structural unit that has to have certain working conditions satisfied. It is also possible to employ certain generators in domestic conditions, or while giving an emergency help in the car, thanks to the portability of certain appliances and under condition that certain measures for their safe functioning are taken, which applies in MRT cabinets as well.

Human organism represents a highly sensitive detector of both thermal and athermal EMF. This is what accounts for efficiency of the application of the external low-intensity EMF while curing certain illnesses as functional disorders of man's immune system. A positive effect is attributed to the external influence of the generator with EMF in MW range which imitates its own informative-management signals of a living organism. Besides, what is also recruited is the organism's defensive compensatory abilities in the process of EMF affecting the cell's membrane and protein structures, which leads to the improvement of the immune system's parameters, which has been the subject matter of many studies.

An insight into some encouraging findings of MRT applied to psychosomatic disorders can be gained through the results of Sit'ko, Devyatkov, Kozhemyakin, Golant, Besonov, Kolbun et al (numerous expert works, published in various expert journals) [1-17,19,20,27-29].

4.1 Our MRT medical results

Our results presented in Table 1 are very encouraging and confirm high efficiency of MRT [8-17]; they also correspond to Russian-Ukrainian results in MRT employment [1-17,19,20,27-29].

Patients and methods. Standard diagnostic procedures were conducted before MRT treatment, in referential hospitals where the patients had already been treated. After that, traditional diagnostic procedures were carried out, for determining functional changes or certain AM's pathology and the analysis of responses on the signal APs, as well as AMSAT diagnostics, in order to work out the prescription solutions and make a selection of APs for MRT employment.

The total number of patients and their clinical effects were divided into three categories (without an improvement, with a moderate improvement up to 70 % and with an significant improvement above 70%). A clinical evaluation for every single disorder is represented in the last column of the Table 1. Moderate improvements were determined according to the degree of the symptom alleviation and (sometimes) according to the corresponding degree of the referential diagnostic parameters improvement. Significant improvements were evaluated in comparison with the initial state.

Painful states of orthopedic-neurologic origin.

They should attract a special attention as MRT can be very efficiently applied. So, here follows a short overview.

Aim: A brief overview of biophysical basis, the integration of conventional diagnostics (CD) and MRT of the pain of orthopedic-neurological origin (ONO).

Patients and methods: Retrospective, a two-year study of MRT painful ONO conditions, in 63 patients (29 M and 34 F), mean age 57 (27-100). The assessment of pain intensity was gained using verbal pain score (VPS) and statistical data analyzed with a T- test.

Results and a comment: Patients had undergone CD with CTh in referential hospitals before applying MRT. It was a persistent pain that indicated involvement of MRT. Pain intensity was monitored: 1st - 10th day, after 1.5 month and during next two years. Statistically significant high pain reduction was observed after a 10-day MRT application ($p < 0.01$).

Pain intensity assessment: VPS-verbal pain score (score on the scale from 1 to 10): little pain: 1, 2, 3; moderate pain: 4, 5, 6; extremely strong pain: 7, 8, 9, 10.

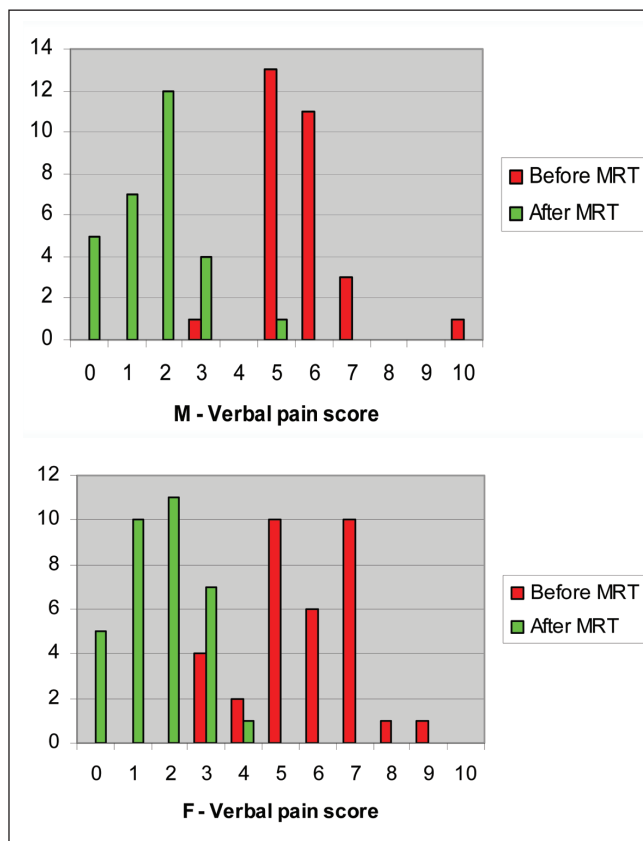


Figure 2. The pain scale assessment before and after MRT: men (above); women (below).

A significant pain reduction with all patients was observed after MRT: In men, the pain decreased on average from 5 to 1.65 (that is as much as 66%); in women, the pain decreased from 5.67 to 1.67 (that is, as much as 70.55%), cf. Fig. 2.

The results achieved with MRT sustained even after 1.5 months, as well as in the following two years.

After a twenty-day MRT course, a statistically significant pain reduction was observed ($p < 0.01$).

5. Anti-Stress Aspects of MRT

MRT can be used in the prevention of a great number of diseases in all age groups. As the greatest number of all illnesses has a psychosomatic nature, and their commonest cause is stress, a timely application of MRT can prevent the somatization and the externalization of many illnesses' symptomatology.

Prevention based on the application within EMF MW range can be regarded as a very promising method in overcoming stressogene provocateurs of the psychosomatic disorders, as it manages to correct initial deviations in EMF AMs and APs, through their structures that play the role of the transmitters within EMW MW range.

In the prophylactic anti-stress microwave resonance program, used upon the endangered AM with action on the APs of this AM, the goal is to establish homeostasis and overcome altered neurohumoral relationships responsible for producing stress reactions of

Table 1. Our medical MRT results (Z. J. Ignjatić) [8-17]

Diseases	Patients	Clinical effects			Evaluation
	No	None	<70%	>70%	
Neurology	408	22	79	307	
DCP (age group 2 to 6)	4	-	3	1	+ st. loc.; EEG; EMG,
Neurological pain	194	10	34	150	+ st. loc
Tunel carrpal sy	2	-	2	-	+ st. loc
Cephalea	58	-	13	45	+ st. loc
Migraine	7	2	1	4	+ st. loc
Neuralgia n. trigemini	5	1	3	1	+ st. loc
Paralysis pl. brachialis	4	1	3	-	+ st. loc, EMG
Sy. Cervicale	8		1	7	+ st. loc.
Sy. Cervicobrachiale	17	1	8	8	+ st. loc.
Radicilopathio L-S	24	5	2	17	+ st. loc.; Rö
Lumboischialgio	70	1	1	68	+ st. loc.; Rö
Hemiparesis post CVI	14	1	7	6	+ st. loc.;
Quadriparesis spast.	1		1		+ st. loc, SDG
Psychiatry	83	-	8	75	
Neurosis	72	-	6	66	sympt.
Sy depresivum	11	-	2	9	sympt.
Traumatology	22	-	7	15	+ st. loc, Rö
Muscular and Skeletal System	95	6	11	78	
Gonarthrosis	18	-	18	-	+ st. loc, Rö
Coxarthrosis	8	3	5	-	+ st. loc, Rö
PHS	8	1	2	5	+ st. loc, Rö
Urology	10	-	-	10	
Cystitis chr.	6	-	-	6	sympt. + lab. bioch.
Prostatitis chr.	3	-	1	2	sympt. + lab. bioch. US
Adenoma prostate	1	-	-	1	sympt. + lab. bioch. US
Gynecology	5	1	-	4	
Dysmenorhea	3	1	-	2	sympt.
Myoma uteri	2	-	-	2	sympt. US
Gastroenterology	24	-	1	23	
Ulcus ventriculi	12	-	1	11	sympt. + lab. bioch.
Gastritis	12	-	-	12	sympt. + lab. bioch.
Upper respiratory tract	36	2	4	30	
Tussis prolongata	3	-	-	3	sympt.
Sinusitis chr.	34	2	1	31	sympt. Rö
Pulmonology	22	2	3	17	
Asthma	22	2	3	17	sympt. spirometry
Dermathovenerology	8	-	3	5	.
Neurodermatitis	5	-	3	2	sympt. + st.loc.
Alopetio areata	3	-	-	3	sympt. + st.loc.
Imunodeficiency	8	-	1	7	K. sl., st. loc., lab. bioch.

the organism and the somatization of the illness. In order to enable the prophylactic anti-stress MRT action, it is necessary to prevent the activation or establishing of a complex psycho-somatization chain of stressogenic influences, by using some of APs with an all-refreshing, calming, relaxing and immunologic effect. Taking into consideration the patient's characteristics, as well as the potential disorder of a meridian or an organ, the *microwave anti-stress prophylaxis* can be conducted on the following APs: GV 20 - *Baihui*, LI 4 - *Hegu*, PC 6 - *Neiguan*, HT 7 - *Shenmen*, ST 36 - *Zusanli*, but out of auricular points only the point 55 - *Shenmen* should be used. *Additional points*: their choice depends on the possible or already present disorders on AMs: GV 14, GV 12, GV 4, CV 6, BL 23 (the point that corresponds with the kidney energy), or point BL-43 ("life's center"), SP 6 (which is a carrier of discomposure on an emotional level, on a mental plane of reason and consciousness) [8-17,21-26].

There have been a great number of studies about various aspects of the usage of the waves within MW range in stress situations and in prevention of psychosomatic illnesses caused by stress.

The clinical tests of CEM-TECH device in stress conditions were performed from 1999 to 2005 in the Science Research Institute of Traumatology and Orthopedics - NII, in the N.I. Lobachevski Institute NGU, and in the Military-Medical Institute of The Frontier (Nizhny Novgorod) [19,20].

Macharet and Korkusho explored the influence of EMI within mm range on the stress state: better MRT effects were produced with the rabbits in hypokinesia than with the group with high mobility - hyperkinesias; In adaptive reactions to stress, the leading role belongs to neutrophils, with the central role in resistance and channeling of the phagocytosis reaction as well as their production of the humoral unspecific protection factors [30].

Temuryanc and the coworkers has published work about the role of neutrophils in limitation of the stress reaction, "Anti-stress MW action" (Moscow, 1991): experiment conducted on experimental animals, with the proof of EHF effect on the functional states of hydrolytic enzymes and dehydrogenize in the 1st stadium of the experimental animals' hypokinesia, with the normalization of the indicators of increased neutrophils while hypokinesia with the limitation of the stress reaction [8-17,27,28].

Lebedeva in her work "CNS reactions on the periphery action of low-intensity emission EHF" points out the changes in a healthy man's EEG correlates which testify to the development of a non-specific activation reaction [8-17,27,28].

5.1 Our study of EEG correlates of anti-stress MRT relaxation

Our study, conducted from 1996 to 1998 in the Institute for Mental Health (Belgrade), explored EEG correlates of anti-stress MRT relaxation [8-17,21-26].

Subjects. The study was carried out on 28 healthy adult volunteers (13 men and 15 women). The subjects were classified into two groups: group 1 (11 subjects) not previously subjected to the MRT treatment and group 2 (17 subjects) that were being subjected to MRT in the past two years.

Procedure. The experiment was conducted in a sound-proof room, dimly lit for observation. Subjects lay comfortably. Each recording session was divided into three sequential periods: (1) relaxing 5 min with eyes closed; (2) MRT 20 min; (3) relaxing 5 min with eyes closed. During those periods two random samples, one minute each, were recorded for every subjects. The EEG record was stored on a hard-disc.

The MRT was applied by the wide spectrum POROG-3 devices, while the frequency measurement was carried out with the narrow spectrum apparatus AMRT-01, adjusted manually. POROG-3 frequency range is 52-78 GHz. Up to 10 mW low-power microwave generators, of the output power density of 0.2-5 $\mu\text{W}/\text{cm}^2$ (much lower than biologically limited 10 mW/cm^2 during 8 hours, as prescribed by USA National Standards, or 10 $\mu\text{W}/\text{cm}^2$ during 8 hours, as prescribed by Russian and Ukrainian National Standards [27,28]) are power supplied by the 220 W, 22 V/50 Hz a.c. or the autonomous 4.5 V d.c. MRT generator was applied on acupuncture points in the following order: GV 20, and the left-side points LI 4, PC 6, HT 7 and Ap 55, which resulted in relaxation, similarly to the parasympathetic effect. The choice of the acupuncture points for the relaxation session was made on the basis of well known principles of acupuncture stimulation, characteristics of the chosen points, and the therapist's experience.

Data Analysis. Time-varying EEG spectra (spectrograms) with 0.5 Hz resolution were worked out by MATLAB program using a 256-point FFT algorithm performed on 2 sec Hamming-windowed half-overlapping epochs. An array of EEG partial power spectra for each subject and each derivation was computed by integration by the trapezoidal rule of the spectrogram over the five frequency bands.

Both groups of subjects have significant changes in the EEG power over the whole head in α and β_1 frequency bands, with observation that a percentage of subjects with minor reactions is much less in the group 1. In both groups of subjects, a decrease in the EEG power is more frequently observed than an increase. As an illustration, in Fig. 3(a-c) the topographic mappings

of the number of subjects (in %) having the significant EEG power changes in the δ , α and β_1 frequency bands, for the two groups of subjects are presented.

The changes in coherency are not too significant. Most prominent changes, over the whole frequency interval (1-30 Hz), are registered in occipital region (O1 and O2). A decrease in the coherency is generally observed.

tude of corresponding EEG waves. An increase in the mental performances was also noted, especially while doing practice examples for which a higher level of operational memory was needed [32].

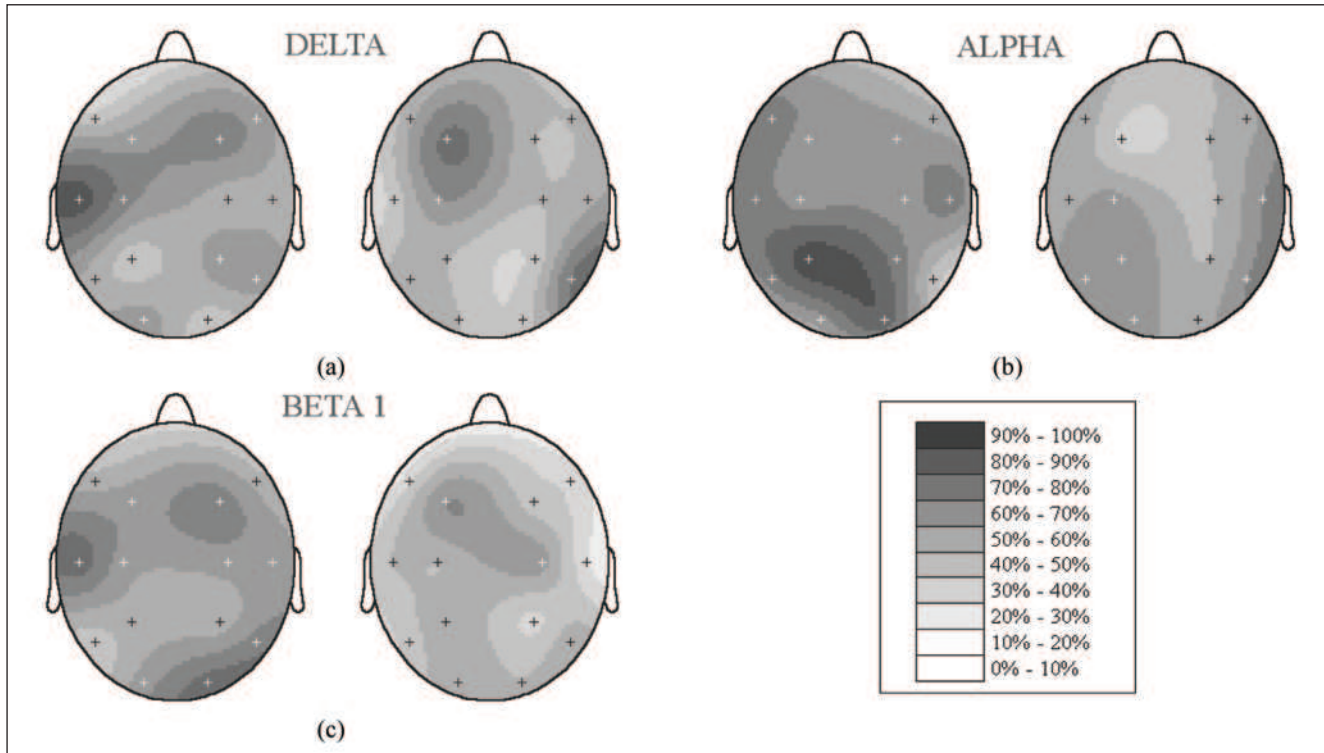


Figure 3. The topographic mappings of the number of subjects (in %) of the group 1 (left) and the group 2 (right), having the significant EEG power changes in the: (a) δ band (1-4 Hz), (b) α band (8-13 Hz), and (c) β_1 band (13-18 Hz). The gradual percentage changes are presented in various degrees of shading, as designated in the insert [8-17,21-26].

The point to be emphasized is that the persons, who had not been previously subjected to this treatment, reacted in a much stronger way, which is possibly the consequence of their less balanced acupuncture systems, corresponding to the information stored in hierarchical brain structures too, which is the subject matter of the study by Vitiello [31]. A dissipative quantum model of storage is modeled as a coherent condensation of certain quanta of the basic brain state, with the shape of a corresponding narrow determined diapason that enables the stored information to organize themselves in hierarchic structures, in accordance with the various life ages of the memories and with the greatness of the corresponding diapasons.

Grabovshchiner, Zukovsky and Jech also explored the high frequency EMF's effects upon the brain, with a faster falling in sleep as well as a better sleep quality, with spectral EEG changes in N-REM and REM sleep cycles, although a hypnotic effect is also possible during the action of waves within mm-range. It was identified that the application of extremely high frequencies leads to the increase in the ampli-

6. CONCLUSIONS

This paper presents biophysical principles and technical aspects, as well as indications and contraindications of microwave resonance therapy (MRT), a new modality which is a synthesis of the ancient Chinese medical knowledge (reflex therapy, acupuncture, acupressure) and some recent major discoveries in biophysics. The treatment of acupuncture points using microwave (of extremely high frequency) radiation in the range from 52 to 78 GHz has yielded impressive clinical results in surgery, orthopedics, traumatology, cardiovascular disorders, urology, gynecology, dermatology, gastroenterology, pulmonology, upper respiratory diseases, cardiology, neurology and oncology. MRT is contraindicated only in the case of acute abdominal pain associated with conditions requiring surgery and also during pregnancy and the menstrual cycle. The high efficacy of MRT has been confirmed in our clinic. MRT has produced a significant improvement in 79.2 % and moderate improvement in 15 % of the patients. A lack of clinical response was seen in only 5.8 % of the patients.

Apstrakt

Korišćenje atermičkih, elektromagnetnih talasa niskog intenziteta u ekstremno visoko frekventnom mikrotalasnom dijapazonu (EM MT) je biomedicinska novina u kvantnoj medicini. Mikrotalasna rezonantna terapija (MRT) bazirana je na rusko-ukrajinskom konceptu o kvantnoj prirodi akupunkturnog sistema, kao dinamičke strukture koja se uspostavlja na lokacijama maksimuma de Brojjevih interferentnih trodimenzionih stojećih talasa. Promene dielektričnih svojstava tkiva dovode do bolesti, deformišući strukturu EM MT stojećih talasa i povezanog akupunkturnog sistema. Mikrotalasna rezonantna terapija (ekstremno visoke frekvencije 42-100 GHz, atermičke energije 10^{-4} eV i ekstremno niskog intenziteta 10^{-21} W/Hz cm^2) rezonantno normalizuje frekventne odgovore u pobuđenom akupunkturnom sistemu i organizam biohemijski savladava bolest putem fiziološko-neurohumoralnih MT i samo-regulatornih akupunkturnih mehanizama. U ovom radu su pokazane biofizičke osnove mikrotalasne rezonantne terapije, metodologija, sličnosti, razlike i novine u savremenim ruskim i ukrajinskim tehnologijama, kao i rezultati primene mikrotalasne rezonantne terapije u sopstvenoj praksi, koji potvrđuju visoku efikasnost ovakvog pristupa.

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