

*Materials of Conferences***EFFECT OF TRAVELING AND ROTATING
MAGNETIC PULSED FIELDS
ON COGNITIVE
AND PSYCHO-VEGETATIVE DISORDERS
IN PATIENTS WITH DYSCIRCULATORY
ENCEPHALOPATHY**

Gil'mutdinova L.T., Iseeva D.R., Yamilova G.T.,
Tsyglin A.A., Mustafin J.M., Akhmadullin R.R.,
Ismagilova A.A., Bogovazova L.R.,
Nazanova E.M.

*Bashkir State Medical University, Institute
of Rehabilitation Medicine and Balneology, Ufa,
e-mail: vmk-ufa@mail.ru*

This article presents a new approach to the treatment of patients with encephalopathy dyscirculatory against atherosclerosis and hypertension, based on the use of traveling and rotating pulsed magnetic fields, which contribute to clinical improvement with normalization of cognitive function, mental and physical state and autonomic tone.

Dyscirculatory encephalopathy (DE) is 67% of the vascular disease of the brain. The core of the clinical picture of DE is the presence of cognitive and psycho-vegetative disorders. Along with the progression of neurologic symptoms with the development of DE occurs and the growth of disorders of higher brain functions. In 60-80% of patients with mild cognitive impairment over 5 years develops dementia. Relevant is the assessment of the degree of cognitive impairment, which should be considered in the tactics of managing patients with DE [1, 2, 3, 4, 5, 6]. In the correction of cognitive impairment of physical therapy techniques are becoming increasingly important, one of which is the total magnetic therapy with the use of the traveling and rotating pulsed magnetic fields [1, 2, 3].

The aim of the study: Assessing the impact of combined treatment with the use of traveling and rotating pulsed magnetic fields on cognitive and psycho-vegetative disorders in patients with DE.

Materials and methods. A survey 110 patients who were treated at the sanatorium «Green Grove» of the Republic of Bashkortostan in age from 47 to 69 years with DE stages I-II on the background of cerebral atherosclerosis and hypertension.

Assessment of cognitive disorders, visual-spatial disorders, psycho-physical state, autonomic tone test was performed using Mini-Mental State Examination (2005), SAN (mood, activity, mood), samples of the «clock», an index Kerdo.

In therapy, patients were divided into 2 groups: basic (56 pers.) and control (54 people). In the study group on the background of basic therapy used magnetic therapy with the use of the general traveling and rotating magnetic fields, pulsed magnetic therapy apparatus of the «Kolibri-Expert»

with a frequency of 100 Hz, the magnitude of the magnetic induction 3,5-32 mT, for 10-15 minutes. In the course 12-10 of daily routines (Russian Federation Patent № 2440833, 01.27.2012). In the control group used only the basic treatment.

Basic therapy included: diet therapy, climato-therapy, intake of mineral water «Nurly», herbal medicine, massage, therapeutic exercise, medication may be needed.

Results and discussion. All patients had predominantly cerebral, cognitive and psycho-emotional disorders. In patients with DE stages I-II (81,8%) dominated disorders such as headaches, impaired concentration, perception, ability to play the new information (76,4%), depressed mood, irritability, anxiety (73,6%), fatigue (71,8%), dizziness, sleep disturbances (65,5%), reducing the memory (57,3%).

Assessment of autonomic tone Kerdo index showed an increase in activity of the sympathetic system with the average of its value $13,1 \pm 0,04$, «vagotonia» – $12,5 \pm 0,03$ and «ayton» – $9,0 \pm 0,05$ points. According to the MMSE test in 52,1% of patients with DE the amount of balls before the treatment was on average $25,9 \pm 0,05$ points, which corresponded to moderate cognitive impairment. In 80,9% of patients with DE stage II rates were reduced the most «attention» and «account».

Memory impairment was observed in 15,1% of patients with DE stage I and 51,1% with stage II DE. In 80,8% of patients with DE had significantly reduced all indices of psycho-physical condition: «the mood» to $3,6 \pm 0,03$, «being» to $4,1 \pm 0,02$, «active» to $4,1 \pm 0,02$.

After the course of treatment in 95,4% patients of the group significantly marked regression of clinical symptoms. Decreased headaches, dizziness, feeling of heaviness in the head (86,4%), improved memory and attention (80,1%), higher efficiency (86,4%), reduced irritability (84,5%) and normal sleep (85,5%). In the comparison group of neurological syndromes, significant changes were observed.

The treatment has helped improve the performance of cognitive functions: attention, account for 14,1% ($p < 0,05$), in memory of 13,1% ($p < 0,05$). Improvements in visual-spatial functions on the results of tests «clock» on 19,5% ($p < 0,05$) in the main group, which indicates an improvement in blood supply to the brain, activation of metabolic processes and improving the stability of the brain to hypoxia. In the comparison group significant decreases in symptoms of cognitive disorders and visual-spatial functions have been identified.

Against the background of complex treatment of patients with normalization of the core group of

autonomic tone observed with the transition to the state of «kayton» with up to $9,0 \pm 0,03$ $12,4 \pm 0,03$.

The high therapeutic efficacy of the traveling and rotating magnetic field pulse shows improvement in mental and physical condition according to the test SAN. A significant increase in the «feel» from 85,5% of patients of the group to 29,8% ($p < 0,05$), «activity» at 24,0% ($p < 0,05$), «mood» by 32, 0% ($p < 0,05$).

Conclusions. General magnetic therapy in patients on the proposed methodology, rendering the action of a systemic nature, is an effective method in treatment of patients with DE stages I-II.

The proposed medical complex with the traveling and rotating pulsed magnetic fields contribute to a more rapid regression of neurological symptoms, improve cognitive and psycho-physical functions of the brain, reduce the manifestations of autonomic dysfunction in patients with chronic brain ischemia.

Spatial heterogeneity of the traveling and rotating pulsed magnetic fields, the combined use proposed by the amplitude modulation of the magnetic field, the frequency reduces the adaptation, reduces the treatment time, increase the therapeutic efficacy and good tolerability.

References

1. Bogolyubov V.M. Physiotherapy and balneology. – M., 2010. – Vol. 1. – S. 276-291.
2. Ponomarenko G.N. Private physiotherapy. – M., 2005. – S. 272-277.
3. Ulashchik V.S. Theoretical and practical aspects of general magnetotherapy /V.S. Ulashchik// Issues of balneology and physiotherapy treatment of physical culture. – 2001. – № 5. – S. 3–7.
4. Yakhno N.N. Encephalopathy. //Guidelines. – M., 2004. – 29 s.
5. Yakhno N.N. Vascular cognitive impairment: clinical manifestations, diagnosis and treatment. // Journal of Neurology. – 2007. – № 5. – S. 45–50.
6. Tariska P., Paksy A. Cognitive enhancement effect of piracetam in patients with mild cognitive impairment and dementia. *Orv Hetil* 2000, 141:1189 – 1193.

The work is submitted to the Scientific International Conference «Research on the priority of higher education on-directions of science and technology», on board the cruise ship MSC Magnifica «Around Europe», 22 May-2 June 2012, came to the editorial office on 03.05.2012.

STRUCTURAL CHANGES OF LEFT VENTRICULUS IN THE RAT HEART DURING ISCHEMIA AND REPERFUSION UNDER APELIN ACTION

Pavlovich E.R., Prosvirnin A.V.,
Serebryakova L.I., Tskitishvili O.V.,
Pelogeykina Y.A., Pistsova T.V.,
Fedoseev V.A., Bepalova Zh.D.

*Laboratory of heart metabolism in institute of
experimental cardiology, RCSPC, Moscow*

Myocardium infarction with 40-minute occlusion of front descending coronary artery was mod-

eled among narcotized male rats of Vistar line with body mass of 300-400 grams with further one-hour reperfusion. Apelin-12 in doses of 0,35 mcmole/kg of body mass was introduced to a part of the animals. It is known that exogenous C-end fragments of apelin-12 can limit the size of myocardium infarction and re-establish the heart function among animals after its regional ischemia (Pisarenko and co-authors, 2011). After the end of physiological test part, hearts were removed from the animals, washed in 0,1 M of phosphate buffer and fixed in 4% solution of paraformaldehyde during 3 days in a fridge. Material was processed in spirits of increasing concentration and primed by epoxide gum like in our publication (Pavlovich, Prosvirnin, 2011). A heart was cut into 4 rings across its longer axis. The second and the third ring from the organ top was cut into smaller pieces that included a free wall of left and right ventricles, myocardium that lies by front and rear inter-ventral furrows, and also an area of inter-atrial and inter-ventral partitions in a single block. Dehydrated material of a heart was accurately placed in capsules for priming and polymerized in thermostat. 1-mkm cuts of heart walls were received from block foundations on ultratome LKB and then colored in toluidine blue. An examination of cuts under microscope in increase of magnification from 150 to 900 showed that expressed alterations in muscle fiber in which destruction of flexing material took place and areas of over-contraction of the rest myofibrils were found in free wall of the left ventricle of an eschemized heart. Cores and mitochondrions in cells looked slightly altered and did not show any divergences in muscle fiber on intercalated discs. The middle part of myocardium was dramatically altered, and areas by endocardium and epicardium looked safe (transversal banding of unaltered myofibrils was observed in myocytes). Contents of some myocytes appeared from cells (including mitochondrions). Usage of apelin-12 decreased damage of contractile apparatus, compared to the control, but zonality of alterations within heart ventricles' walls preserved. It corresponds to the biochemical observations of decrease in reperfusion damage among rats in vivo under decrease in applelin-12 that lowered markers of myocyte necrosis (Pisarenko and co-authors, 2011). Stagnant alterations in blood vessels and accumulation of basophils in them with intensively-colored intracellular granules were observed among experimental animals. An expressed degranulation was observed within mast cells. A quantitative analysis of half-thin cuts and ultrastructure research of material of all heart cells from animals, including tracing myocardium (atriventricular node and fascicle) is required.

The work was submitted to International Scientific Conference «Modern high technologies», (Spain-France), Barcelona – Cannes, July 28 – August 4, 2012, came to the editorial office 16.05.2012.