KAP-MT/8 – « MAGNETIC THERAPY DIATON » – HARDWARE-SOFTWARE 8-CHANNEL SYSTEM OF CONSTANT, VARIABLE AND TRAVELING MAGNETOTHERAPEUTIC FIELDS

The system is designed for implementation of a new therapeutic technology by means of impact of low-intensity dynamic magnetic fields of complex structure on patient’s body as well as on its separate parts.

**SPECIFICATIONS**
Magnetic fields types: constant, variable, pulsed, traveling, complex modulated.

Automatic anthropometric electromagnetic bed: (WxDxH) mm, no more than 2004x1226x950.

Supply voltage (230 ± 23)V, 50 Hz.

Consumed power no more than 1 kW.

Magnetic induction maximum value 3 mTl.

Number of control channels 8.

Range of magnetic field frequency setting from 0.3 to 100 Hz.

Possibility to vary magnetic induction vector.

Weight of the system no more than 160 kg.

**SYSTEM FUNCTIONAL CAPABILITIES allow to:**
- create a dynamic magnetic therapy environment of complex structure, surrounding the patient;
- Assign individual dynamics and form of magnetic field for each patient, depending on illness.
- precisely dose biotropic parameters of magnetic fields taking into account the patient’s physiological parameters;
- synchronize dynamics and form of magnetic field with the main patient’s biorhythms;
- register and analyze parameters of the patient’s cardiovascular activity;
- realize independent multichannel control of magnetic field by inductor groups with magnetic field intensity, magnetic induction vector direction and impulse action time individual variation;
- create an extensive base of medical methods for curative magnetic therapy action and promptly select an optimal treatment method for each patient;
- implement magnetic therapy and musical effects for wellness and anti aging purposes;
- provide two and three-dimensional visualization of magnetic field (curative method) in real time;
- Access to control software though user friendly interface.

High functionality of the system allows recommending it to doctors of different medical specialties. It can be used for treatment of an extensive variety of diseases as well as for creation of new advanced curative methods.

**AIM OF TREATMENT**
Recuperation of functional reserves, normalization of metabolic processes, amelioration of microcirculation, anti-inflammatory, hypotensive and stimulating action. The system is successfully applied for treatment of cardiovascular diseases and other pathologies due to blood microcirculation disturbances.

**SPHERE OF APPLICATION**
The system is designed to be utilized in physiotherapeutic departments of clinics, hospitals, rehabilitation centers, sport medicine, wellness and anti aging facilities as well as in medical research establishments and centers.
The system consists of the following units:
1. Personal computer
2. Automatic anthropometric electromagnetic bed
3. Control unit

The system structure is built on interaction of the following functional units:
1. Personal computer
2. Special software
3. Bank of testing and curative methods
4. User interface for curative method selection
5. Automatic anthropometric electromagnetic bed
6. Control unit
7. Sensor of biorhythms
HEMODYNAMIC EFFECTS OF HYPERTENSIVE DISEASE THERAPY BY MEANS OF LOW INTENSITY COMPLEX MODULATED MAGNETIC FIELD UNDER THE CONDITIONS OF A CLIMATIC HEALTH RESORT IN GELENDZHIK

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Branch office of Federal State Institution (FGU) «Russian Scientific Center of Rehabilitating Medicine and Balneology (RNTs VMiK) of Russian Ministry of Public Health and Social Development» – Sanatorium resort «Vulan», in Gelendzhik

Anthypertensive drugs rendered successful hypertensive disease (HD) therapy. Experimental and clinical cardiology achievements allow to suppose that HD pathogenesis is due to many factors, that determinates the application not only of drug therapy but also of different curative physical factors (natural and preformed). According to data about HD pathogenesis their effect must be aimed at amelioration of blood circulation, metabolism and functional status of CNS, hypothalamic structures and neurohumoral regulation of vascular tone, at enhancement of hemodynamics, at decrement of vascular hypersthenia and myocardium hyperfunction, at improvement of renal blood circulation, as well as at increase of blood circulation and the body adaptation capacity to external influences.

Creating of dynamically changing complex structure magnetotherapy environment around the whole patient’s body through time and space, accurate dosage of magnetic field program and form for an individual patient taking into account localization of affection and physiological parameters of the patient, magnetic field dynamics and form synchronization with the patient’s main biorhythms permit to achieve a significant amelioration of hemodynamic parameters, diminution of vasospasms and reduction of ischemia degree because of microcirculation enhancement (raise of coefficient of variation, increase of endothelium secretory activity, normalization of precapillary microvessels muscle tone, increase of blood supply and of pulse amplitude in microvascular bed), as well as blood viscosity reduction and coagulogram parameters normalization.

The objective of the research is to justify application expediency of dynamic magnetic fields with complex structure generated by hardware-software system «Magnetic Therapy Diaton» for patients with HD during rehabilitating treatment under conditions of a climatic health resort on the basis of studying hemodynamics parameters (average indices of systolic and diastolic blood pressure per day, per night, per 24 hours, diastolic blood pressure night decrease), general psychic well-being indices and of the patients’ life quality estimation. 56 patients with hypertensive disease of I–II degree (25 female and 31 male aged from 25 to 59, the average age – 46,7 years) were examined.

The disease duration of the examined patients was from 2 to 20 years. All the patients were comparable in accordance with sex, age, disease duration, ABP level, concomitant risk factors. The patients were divided into 2 groups. The patients of the first group received magnetotherapy treatment by means of «Magnetic Therapy Diaton» system associated with diet therapy, underwater massage shower, aroma therapy, climatic cure. The patients of the second group received rehabilitating cure: diet therapy, underwater massage shower, aroma therapy, climatic cure (air cure, phyto- and thalassotherapy). Under the influence of therapeutic cure positive dynamics of subjective and objective parameters were observed in the experimental and in the control group. Though, the patients of the first group remarked positive changes earlier and they were observed in more patients. In the main group hemodynamic indices improvement was achieved on the 2nd or 3rd day of the treatment, and in the control group it occurred on the 6th or 8th day of the treatment. Parameters positive dynamics of ECG (heart rate reduction) in the main group was observed in 90% of patients, in the control group in 70,8% of patients. The quantitative estimation of life quality realized by means of checklists presented a significant amelioration of parameters in both groups. Positive dynamics of life quality parameters, of subjective and objective clinical aspects of HD during rehabilitating by dynamically changing magnethotherapeutic system «Magnetic Therapy Diaton» was observed in 86,8% of patients and positive changes were maintained during 6 months. It allows to recommend this physical curative method to be applied in climatic and other resorts.
CLINICAL APPLICATION OF DYNAMIC MAGNETIC FIELDS GENERATED BY «MAGNETIC THERAPY DIATON» COMPLEX MAGNETOTHERAPY SYSTEM

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Moscow Regional Scientific Research Clinical Institute named after M.F. Vladimirsky (MONIKI);
N.S. Barsuk, Candidate of Medicine, Yu.B. Kirillov, Doctor of Medicine, Ryazan State Medical University named after I.P. Pavlov

«Magnetic Therapy Diaton» hardware-software system is a new generation complex magnetotherapy system. Its high efficiency is due not only to its unique technological capabilities to form a great variety of dynamic magnetic fields with complex structure but also to its unique curative methods based on understanding of nonspecific action mechanism and peculiarities of biological time and synchronization in biosystems on exposure to low dynamic magnetic fields. From 1993 to 2007 more than 60 thousands patients in 36 clinics in Russia and in CIS were treated by overall effect systems of «Magnetic Therapy Diaton» class. An analysis of treatment of 1840 patients in Moscow and Ryazan clinics was carried out to estimate clinical effect of «Magnetic Therapy Diaton» complex magnetotherapy system application. Among the patients there were 760 with atherosclerosis of lower limbs great vessels and obliterator endarteritis, 90 with discicular encephalopathy (DE), 520 with advanced lower limbs angiopathies in diabetes, 130 with hypertensive disease associated with ischemic heart disease, 40 with hypertensive disease associated with obstructive lungs disease, 400 with motor apparatus diseases (osteoarthrosis, degenerative dystrophic alterations in vertebral column), varicose, venous indifficiency and trophic disturbances. Prolonged remissions and subjective challenges disappearance were observed.

Treatment methods by means of «Magnetic Therapy Diaton» pulsed and traveling magnetic field (PTMF) were developed and scientifically proved in Moscow Regional Scientific Research Clinical Institute named after M.F. Vladimirsky (MONIKI), in Cardiovascular Surgery Scientific Research Center named after A.N. Bakulev of Russian Academy of Medical Science, in State Scientific Research Institute of Military Medicine of Moscow Region of Russian Federation and in Ryazan State Medical University.

Treatment of patients with occlusive diseases of lower limbs arterias (ODLLA)
A study of treatment efficiency of PTMF generated by «Magnetic Therapy Diaton» polymagnetic system was realized in approximately 2000 patients with occlusive diseases of 760 patients treated by magnetotherapy only. All the patients had pregangrenous stage of the disease. The treatment efficiency was estimated on the basis of clinical data of Doppler ultrasonography, of tissular blood flow, central and peripheral hemodynamic condition and blood viscosity exploration and other. The treatment consisted of 16–20 procedures, each procedure lasted up to 20 minutes. After the cure only 6% out of 22% of patients suffered form pains at rest. 49,7% of patients were able to go the distance of 500 m without pains, before the cure they had been 13,8%.

The Doppler ultrasonography (DUSG) detected the arterial blood flow velocity average raise of 17% in the affected limb, and 23% in the collateral limb. The muscle blood velocity raised from 1,48±0,07 to 2,1±0,07 ml/min/100 g of body weight (P < 0,01), the rheographic index increased in shins and foot. The efficiency of applying magnetotherapy only was 80,8%, the efficiency of magnetotherapy associated with drug therapy was from 81 to 92%.

Treatment of discicular encephalopathy
The clinical analysis is based on treatment and examination of 90 patients with DE, more fundamental tests were realized in 20 patients of the experimental group. Their complex treatment included drugs and magnetotherapy by means of «Magnetic Therapy Diaton» system; 10 patients of the control group were treated by drugs only. During the procedure all the patients remarked somnolence, 30% of patients remarked unsound sleep.

The depressive background decreased during the 4th of the 5th procedure in 85% of patients. Irritability, anxiety, dissatisfaction diminished and amelioration of sleep was remarked. Headache and vertigo reduced mostly to the end of the cure. Cardialgias disappeared in all the patients suffering from heartache syndrom.
The blood flow volume increased in carotid and vertebral arteries, the cerebral blood flow rose too. In order to objectify neurodynamic processes an electroencephalography (EEG) was carried out in the patients by means of 16-channel system «Neuroscope-416A» of «Biolo» company. At the beginning the EEG presented with insignificant general cerebral iterations. The visual estimation after the cure fulfilled showed positive modifications such as consolidation of alpha rhythm, its modulations restoration and zonation, lower limbs arteries (ODLLA), among them there were reduction of alpha and beta oscillations acute forms, slow wave activity diminution and bilateral-synchronous scintillations rate fall. The performed treatment produced beneficial effect on detected zonal disbalance that gives evidence of restoration of neurodynamic processes in the brain.

**Treatment of diabetic angioneuropathies (DA)**
Diabetes occupies one of the first places in the structure of Earth population disease incidence. 3% of population suffers from this disease. Its most serious complication is vascular disturbances which are micro- and macro-angiopathies. 520 patients were observed, among them there were 291 with insulin dependent diabetes, 229 with non insulin dependent diabetes. The PTMF produced the maximum effect on oedemas reduction (they disappeared in all the patients almost) and on limbs temperature modification. Among supplementary investigative methods the most dynamic were those of rheovasography (improvement observed in 70% of cases), laser fluorometry (improvement observed in 88% of cases), isotopic examination (improvement observed in 76% of cases), ultrasonic examination of blood flow (positive results in 68% of cases).

**Cardio-synchronized affect of magnetic field in hypertension**
During the treatment of patients with different nosological forms a distinct reduction of arterial tension was observed. It was rational to carry out a undemental study of patients with hypertensive disease, ischemic disease and hypertensive disease associated with obstructive lungs disease. 130 patients were tested. The efficiency was determinate by means of daily monitoring of arterial tension, ECG monitoring by Holter’s method, cholesterol and prothrombin levels were also determinate. To the end of the cure 80% of patients with ischemic heart disease (IHD) did not take nitroglycerine, in the control group (the patients treated by drugs only) they were only 48%. In HD associated to IHD positive results were observed to the end of the treatment in 84% of cases. It was manifested by stable ABP reduction, general condition amelioration, heartache relief, normalization of sleep and pulse, disappearance of breathlessness at dynamic strain. The cure by PTMF associated with drug therapy resulted in cholesterol and prothrombin level reduction in 65% of patients (in the control group in 40%). The magnetotherapy was the most efficient in patients with IHD of stages 1–2 associated with HD of stages 1–2. In patients with HD associated with COPD amelioration of breath during the procedure was observed and it lasted during the day. During the 5th-7th procedure lungs rales reduced, ABP decreased and the pulse became less frequent.

According to the ECG daily monitoring by Holter’s method after the treatment positive dynamics were observed in 69% of cases (in the control group in 50% of cases). The daily profile of SABP and DABP in all the patients treated by PTMF was close to normal values.

In the control group positive dynamics of daily profile of AT were observed in 52% of cases. The obtained data prove beneficial affect of PTMF in patients with HD, IHD, in HD associated with COPD. That is due to direct affect on nervous and humoral regulation of cardiovascular system.

Furthermore, a treatment analysis of 300 patients with motor apparatus diseases such as osteoarthrosis, simple necrosis of femoral head, degenerative dystrophic alterations of vertebral column was carried out. The amelioration was observed in 80–82% of cases, it was expressed by pain syndrome reduction, range of motions increase in affected articulations at 5–10 degrees, inflammatory process reduction, improvement of coagulogram and thermography indices.
Clinical Application of Complex Dynamically Variable Low-Intensity Magnetic Fields Generated by «Magnetic Therapy Diaton» Hardware-Software Device for Treatment of Bronchial Asthma

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Bronchial asthma (BA) is a widespread human disease which occupies one of the first places in mortality rate. The treatment of BA remains a matter of arguments because existing therapeutic regimens are not always efficient, and medications prescribed in BA have many side effects. For this reason, non medicament treatment methods, such as physiotherapy, are those of interest. Magnetic field (MF) has been successfully applied in pulmonology practice since many years, because it exerts influence upon key factors of BA pathogenesis.

The objective of the present study was to investigate dynamics of clinical and laboratory indices in patients with BA in response to complex treatment by means of low-intensity dynamically variable MF generated by «Magnetic Therapy Diaton» hardware-software device. «Magnetic Therapy Diaton» hardware-software device is a new generation magnetotherapy equipment. It forms therapeutic magnetic environment around the patient's body. The feature of the environment is that it creates magnetic field with evident space-time inhomogeneity, it generates an extensive ensemble of low-intensity dynamically variable magnetic fields of almost any form and it is possible to synchronize the effect with the main patient's biorhythms. The device is provided with a user interface permitting to create intended treatment methods. 3-dimensional visualization of generated magnetic field in real time allows displaying field variation dynamics, time-and-frequency parameters and magnetic field gradient and vector alteration during the exposure. A bank of methods on different nosologies simplifies the work of operators. In order to facilitate the user’s work the device has the option to enter and to store any data about the patient (registration mode). Besides, it is possible to monitor in feedback mode parameters of variation pulsometry and to process mathematically obtained parameters.

During the reporting period 62 patients with BA of medium and high severity, aged on average 52.3 ± 7.7 and 53.1 ± 8.3 respectively, were examined. BA diagnostics and classification was realized in accordance with GINA criteria (2002, 2006). Patients with insular diabetes and internal diseases in acute condition were excluded. All the patients were subjects to investigations of immunograms, of pro-inflammatory interleukins (PIIL) such as alpha tumor necrosis factor (α TNF), 1 beta interleukin (18 IL) and interleukin 6 (IL 6) by immune-enzyme method; as well as to common with adaptive response determination by L. Kh. Garkavi. Two observation groups were formed: the first group included the patients with BA aggravation (23) who were treated in a pulmonology department and who were receiving standard therapeutic treatment supplemented by a cure of 10 procedures by low-intensity dynamically variable magnetic field generated by «Magnetic Therapy Diaton» hardware-software device. The comparison group included inpatients who were receiving standard therapeutic treatment only. A group of 31 ambulatory patients with stable remission of BA was also formed. The remission was determined in accordance with GINA criteria (2002, 2006). All the patients received bronchodilating and anti-inflammatory therapy as per GINA recommendations. The treatment of patients of the observation group (22) was supplemented by magnetotherapy in compliance with the described above method. All the patients were subjects to investigation of laboratory inflammatory markers before and after the treatment. In the comparison group these parameters were also determined twice with an interval of several weeks. The results of the study were treated by means of Statistica 6 software packet with the use of Mann-Whitney nonparametric test.

Results and discussion. The results of CBA did not present significant difference in patients of the experimental and of the control groups before the treatment. Before the discharge from the hospital, lymphocytes level in the patients whose treatment had been supplemented by «Magnetic Therapy Diaton» magnetotherapy was lower than lymphocytes level in the patients who had received standard therapeutic treatment only – 25.1±6.4 and 32.7±9.2 respectively, (p=0.041). Initially, in the experimental group exercise reactions (ER) – 33.5% and stress reactions (SR) – 26.6% cases prevailed; there were 20% of balanced activation reactions (BAR) cases and 20% of raised activation reactions (RAR). In the comparison group 37.5% of patients presented with ER, 25% of patients presented with BAR and RAR, SR was observed in 12.5% of patients only. After the treatment the correlation changed – in the treatment group 55.5% of patients presented with ER, 22.2% with BAR and RAR. In the comparison group BAR prevailed (50%); 12.5% and 37.5% of patients presented with ER and RAR respectively.

L. Kh. Garkavi and co-authors (2002) proved that ER is optimal by energy usage. In this case vital functions...
are well balanced; the body can exist a long time without compensatory reserves exhaustion risk. BAR occurs in response to weak stimuli which are not life threatening; neurohumoral adaptive systems are activated without overexertion. RAR is observed in case of stronger stimuli affect, it is characterized by maximum tension of all the compensatory systems. SR occurs in case of adaptation mechanisms exhaustion. It is remarked that the patients of the treatment group presented, generally, with less compensatory systems tension than in the comparison group. It seems optimal for patients of mature age with chronic pathology, because a long activation stage may lead to adaptation mechanism disturbance. The investigation of PIIL before the treatment no significant differences were detected between the observation and the comparison groups. Before the discharge form the hospital IL 1 blood level in the patients treated by «Magnetic Therapy Diaton» device was lower than in the comparison group – 1,78±1,2 pg/ml (median 2,0) and 6,1±4,5 pg/ml (median 6,8) respectively, p=0,020. It is known that IL 1 activates a cascade of cytochemical reactions and it is one of the key inflammatory mediators. Consequently, laboratory remission was more complete in the patients who underwent a magnetotherapy cure. In the immunograms before the treatment immunoglobulin A (Ig A) level variation was observed. Its concentration was higher in the patients of the experimental group – 2,7±0.8 against 1,7±0,11 in the control group (p=0,009). After the treatment the assay for T-activin presented with better effect in the patients of the observation group than in the patients treated by standard therapy only – 56,4±13,5% and 42,5±4,6% respectively, p=0,030. The assay for T-activin gives evidence of immunocompetent cells procreation and differentiation activity, and primarily, it is question of T-suppressors. Consequently, a higher value of this assay shows sanogenesis mechanisms efficiency, because BA is a disease primarily due to immune system dysfunction. Besides, in the observation group immunoglobulin M level (Ig M) varied within normal range (1,23±0,34); in the comparison group it was below the normal level (0,95±0,08), the difference is significant, p=0,045. Ig M serum level represents insipid immune response, exceeding of normal values means that inflammation persists and remission is incomplete, but, at the same time, diminution of its concentration is undesirable, because it is indicative of immune system insufficiency. Immunodeficiency may be observed after a systemic glucocorticoid therapy, which is the case of patients with BA. On the basis of the fact that in the observation group Ig M level was normal, it is possible to suppose that MF «attenuates» the side effects of glucocorticoid therapy by retaining immunogram indices within normal There were no significant differences of CBA in the patients with stable remission before and after the treatment. There were no significant differences from the comparison group. However, lymphocytes level tended to diminish in the patients after MF exposure – 32,5±11,5% against 39,7±7,2% in the control group, p=0,079. Attention should be paid to the fact that in the both groups during the first and the second investigations of peripheral blood adaptation systems tension was detected: in the observation group before the treatment 9,5% of patients presented with ER, 28,6% BAR, 57,1% RAR and 4,8% SR. After the treatment the patients with RAR prevailed too – 38,0%, but the part of the patients with SR and BAR increased – 19,0% and 42,9% respectively. In the comparison group, during the first and the second investigations, 44,4% of patients presented with RAR, the part of ER did not change (23,2%), but the number of patients with BAR increased up to 33,3% (23,2% initially). This confirms the fact that compensatory reserves in patients with chronic diseases remain constantly tense. In order to avoid adaptation mechanism exhaustion and disturbance, it is necessary to apply modulating actions such as general physiotherapeutic procedures. To increase their efficiency it is desirable to combine them with other factors which produce beneficial effect on general resistibility of the body, such as exercise therapy, tempering, adaptogens. Initially, in the immunogram there was a difference in Ig A level – 2,59±0,67 g/l in the observation group and 1,68±0,02 g/l in the comparison group, p=0,0079. After the reinvestigation in the patients exposed to MF Ig A level was 2,49±0,5 g/l against 2,19±0,33 g/l in the comparison group, the difference is statistically unreliable. This confirms bibliography data about normalizing effect of low-intensity MF exposure on the integrative systems of the body. There were no significant changes of PIIL level after the double investigation in the both groups of patients. It may mean that in case of not only clinical but also laboratory remission, the application of MF does not produce any supplementary changes.

The results of the executed study provides strong evidence that the application of dynamic low-intensity complex structure MF generated by «Magnetic Therapy Diaton» hardware- software device for treatment of bronchial asthma optimizes the body integrative systems condition and converts them into a more energy saving and secure functional mode. These changes are more remarkable in patients with acute stage of the disease; besides, MF diminishes side effects risk of hormonal therapy in this kind of patients.

Application Efficiency of “Multimag”
Chronomagnetotherapy in type II Diabetes

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«Central Clinical Sanatorium (TsKS) of RF Federal Security Service (FSB) named after F.E.Dzerzhinsky»

Diabetes is a socially important disease. Its course is associated with vascular complications, which can lead to disability and mortality. The main pathogenetic factor of angiopathy is hyperglycemia and associated hemorheologic changes. This results in peripheral microcirculation disorder, which leads to an end-organ damage, decreased quality of life and premature death. In this respect the problem of development and practical application of prophylactic non-medicated measures with the focus on normalization of peripheral circulation in diabetes remains one of the current concerns.

The research objective is method approbation of “Multimag”- based chronomagnetotherapy in patients with angiopathies associated with Type II Diabetes.

Material and Methods: We had enrolled 16 patients aged from 30 to 66 (9 male(56.3%) and 7 female (43.7%)). The experimental group was formed of diabetics who suffered from weakness, parasthesia and chill of foot, as well as cramps and pain in gastrocnemius muscles at rest and tension. All patients had baseline function established with a complex of clinical and biochemical investigations based on 26 parameters (liver function tests, lipid, coagulation and glycemic profiles).

During a standard sanatorium-resort therapy, which included climatotherapy, thalassotherapy and exercise therapy each patient received 8 daily chronomagnetotherapeutic procedures. We had used 8 channel ‘Multimag” hardware-software system using protocol or treatment of lower limbs diabetic angiopathy. (Traveling magnetic field 8-1) statistical analysis was carried out with the help of “Statistica 7.0” software packet.

Results: All patients showed general health improvement, decrease of pain and fatigability of lower extremities when walking and resolution of cramps. Adverse reactions were not registered.

Analysis of clinical and laboratory results showed an improvement of core parameters. Lipid profile improved by 16.4% on an average; coagulation profile improved by 12.3%; ALT and AST by 12%; glycemia level decreased by 11.2%.

5 Pairs of parameters complying with the normal law of probability distribution (table1) were defined by Lilliefors criteria and Shapiro-Wilks W-test.

Hypothesis verification of dependent sample average values equality including the data of ‘Before and “After” treatment was performed using T-test. Four pairs of parameters showed the average value difference that was found statistically significant. (Table 2)

The rest of the parameters that were not subject to the normal probability distribution were analyzed using Wilcoxon matched pair test. Six pairs of parameters with statistically significant “Before” and “After” the treatment average value difference were obtained. (Table 3)

Conclusions: The obtained data shows clinical efficiency of chronomagnetotherapy in treatment of angiopathies associated with Type II Diabetes, which allows us to recommend this method for extensive application in sanatorium-resort therapy.
Table 1.
Set of parameters complying with the normal law of probability distribution.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>maxD</th>
<th>Tests of Normality</th>
<th>W</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPT 1</td>
<td>16</td>
<td>0.235664</td>
<td>p&lt;0.05</td>
<td>0.807944</td>
<td>0.003479</td>
</tr>
<tr>
<td>APPT 2</td>
<td>16</td>
<td>0.192730</td>
<td>p&lt;0.15</td>
<td>0.922738</td>
<td>0.186676</td>
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<tr>
<td>Cholesterol 1</td>
<td>16</td>
<td>0.241567</td>
<td>p&lt;0.05</td>
<td>0.883220</td>
<td>0.043568</td>
</tr>
<tr>
<td>Cholesterol 2</td>
<td>16</td>
<td>0.171273</td>
<td>p&lt;0.20</td>
<td>0.932049</td>
<td>0.262668</td>
</tr>
<tr>
<td>ALT 1</td>
<td>16</td>
<td>0.216590</td>
<td>p&lt;0.05</td>
<td>0.887701</td>
<td>0.026084</td>
</tr>
<tr>
<td>ALT 2</td>
<td>16</td>
<td>0.208415</td>
<td>p&lt;0.10</td>
<td>0.849027</td>
<td>0.013183</td>
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<tr>
<td>AST 1</td>
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<td>0.225483</td>
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<tr>
<td>AST 2</td>
<td>16</td>
<td>0.236493</td>
<td>p&lt;0.05</td>
<td>0.887571</td>
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<tr>
<td>LDL_chol 1</td>
<td>16</td>
<td>0.245204</td>
<td>p&lt;0.05</td>
<td>0.858802</td>
<td>0.018407</td>
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<tr>
<td>LDL_chol 2</td>
<td>16</td>
<td>0.163414</td>
<td>p&lt;0.20</td>
<td>0.882520</td>
<td>0.042482</td>
</tr>
</tbody>
</table>

* APPT – activated partial prothrombin time

Table 2.
Set of statistically significant differences in parameter average values, complying with the normal law of probability distribution, found in examined patients.

<table>
<thead>
<tr>
<th>Variable</th>
<th>T-test for Dependent Samples</th>
<th>Marked differences are significant at p&lt;0.05000</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPT 1</td>
<td>29.75000</td>
<td>3.60714</td>
</tr>
<tr>
<td>APPT 2</td>
<td>25.06250</td>
<td>4.76751</td>
</tr>
<tr>
<td>Cholesterol 1</td>
<td>6.60187</td>
<td>1.50171</td>
</tr>
<tr>
<td>Cholesterol 2</td>
<td>5.31619</td>
<td>0.01601</td>
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<tr>
<td>ALT 1</td>
<td>35.73500</td>
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<tr>
<td>ALT 2</td>
<td>32.07500</td>
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<tr>
<td>AST 2</td>
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<td>9.03614</td>
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<tr>
<td>LDL_chol 1</td>
<td>4.1025</td>
<td>0.98849</td>
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<tr>
<td>LDL_chol 2</td>
<td>3.91625</td>
<td>1.00234</td>
</tr>
</tbody>
</table>

* APPT – activated partial prothrombin time

Table 3.
Set of statistically significant differences in parameter average values non-complying with the normal law of probability distribution.

<table>
<thead>
<tr>
<th>Pair of variables</th>
<th>Wilcoxon Matched Pairs Test</th>
<th>Marked tests are significant at p&lt;0.05</th>
<th>Valid N</th>
<th>T</th>
<th>Z</th>
<th>p-level</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 &amp; T2</td>
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* – prothrombin index (PI)