

Cardiovascular

Klin Med (Mosk). 2003;81(1):24-7.

[Clinico-functional efficacy of medicinal and photon stabilization of cell membrane in patients with angina pectoris]

[Article in Russian]

[Vasil'ev AP](#), [Senatorov IuN](#), [Strel'tsova NN](#), [Gorbunova TIu](#).

Modification of erythrocytic membrane and the trend in clinicofunctional indices were studied in 90 patients with angina of effort (FC I-IV) in the course of treatment with a combination of membranoprotective drugs (group 1), magneto-laser radiation (group 2) and imitation of laser radiation (group 3). In patients of groups 1 and 2 the treatment resulted in stabilization of cell membrane accompanied with a hypotensive effect and increased exercise tolerance due to more effective cardiac performance.

Vopr Kurortol Fizioter Lech Fiz Kult. 1999 Sep-Oct;(5):7-9.

[The characteristics of the geroprotective action of magnetotherapy in elderly patients with combined cardiovascular pathology]

[Article in Russian]

[Abramovich SG](#), [Fedotchenko AA](#), [Koriakina AV](#), [Pogodin KV](#), [Smirnov SN](#).

Central hemodynamics, diastolic and pumping functions of the heart, myocardial reactivity, microcirculation and biological age of cardiovascular system were studied in 66 elderly patients suffering from hypertension and ischemic heart disease. The patients received systemic magnetotherapy which produced a geroprotective effect as shown by improved microcirculation, myocardial reactivity, central hemodynamics reducing biological age of cardiovascular system and inhibiting its ageing.

Lik Sprava. 1992 May;(5):40-3.

[The effect of combined treatment with the use of magnetotherapy on the systemic hemodynamics of patients with ischemic heart disease and spinal osteochondrosis]

[Article in Russian]

[Dudchenko MA](#), [Vesel'skii ISh](#), [Shtompel' VIu](#).

The authors examined 66 patients with ischemic heart disease and concomitant cervico-thoracic osteochondrosis and 22 patients without osteochondrosis. Differences were revealed in values of the systemic hemodynamics with prevalence of the hypokinetic type in patients with combined pathology. Inclusion of magnetotherapy in the treatment complex of patients with ischemic heart disease and osteochondrosis favours clinical improvement, normalization of indices of central and regional blood circulation.

Vopr Kurortol Fizioter Lech Fiz Kult. 1994 Mar-Apr;(2):18-20.

[The effect of a low-frequency magnetic field on erythrocyte membrane function and on the prostanoid level in the blood plasma of children with parasystolic arrhythmia]

[Article in Russian]

[Vasil'eva EM](#), [Danilova NV](#), [Smirnov IE](#), [Kupriianova OO](#), [Gordeeva GF](#).

As shown by clinical and biochemical evidence on 23 parasystolic children, the treatment with low-frequency magnetic field improves humoral and cellular processes participating in cardiac rhythm regulation. There is activation of Ca, Mg-ATPase in the red cells, a reduction of plasma thromboxane levels. Red cell phospholipid composition insignificantly change. Further courses of magnetotherapy may lower the risk of recurrent arrhythmia.

Vopr Kurortol Fizioter Lech Fiz Kult. 1996 Mar-Apr;(2):5-8.

[The effect of exposure to magnetics and lasers on the clinical status and the electrophysiological indices of the heart in patients with cardiac arrhythmias]

[Article in Russian]

[Budnar' LN](#), [Antiuf'ev VF](#), [Oranskii IE](#), [Bekhter TV](#).

Magnetolaser radiation has a considerable influence on electrophysiological condition of the sinus node and sinoatrial zone. There are cases when patients with sick sinus syndrome get rid of arrhythmia. The treatment is safe and promising for further studies.

Klin Med (Mosk). 2000;78(3):23-5.

[Characteristics of microcirculation and vascular responsiveness in elderly patients with hypertension and ischemic heart disease]

[Article in Russian]

[Abramovich SG.](#)

Microcirculation and vascular responsiveness were studied in 52 patients with arterial hypertension and ischemic heart disease versus 48 healthy elderly persons. The patients were found to have defects of the end blood flow in all links of microcirculation, longer and more severe vasoconstriction of conjunctival and skin vessels in response to norepinephrine and cold stimulation tests.

Vopr Kurortol Fizioter Lech Fiz Kult. 2001 Mar-Apr;(2):11-5.

[Therapeutic complexes of physical factors in mild arterial hypertension]

[Article in Russian]

[Kniazeva TA, Nikiforova TI.](#)

Three therapeutic complexes were compared clinically in patients with mild arterial hypertension. Complex 1 consisted of dry air--radon baths, bicycle exercise and exposure of the renal projection area to decimetric electromagnetic field. Its efficacy was 90%, mechanism of the hypotensive action is reduction of enhanced activity of the sympathico-adrenal and renin-angiotensin-aldosterone systems, improvement of water-mineral metabolism and lipid peroxidation. Complex 2 consisted of dry effervescent baths, anaprilin electrophoresis with sinusoidal modulated currents and exposure of the renal projection area to low-frequency alternating magnetic field. Its efficacy was 80%. It affects renin-angiotensin-aldosterone system, water-mineral metabolism and lipid peroxidation. Complex 3 consisted of electric sleep, laser therapy and general sodium chloride baths. Its efficacy was 63%. The effect was due to inhibition of high sympathico-adrenal system.

Vopr Kurortol Fizioter Lech Fiz Kult. 2000 May-Jun;(3):9-11.

[The use of low-frequency magnetotherapy and EHF puncture in the combined treatment of arterial hypertension in vibration-induced disease]

[Article in Russian]

[Drobyshev VA](#), [Filippova GN](#), [Loseva MI](#), [Shpagina LA](#), [Shelepova NV](#), [Zhelezniak MS](#).

Combination of EHF therapy + magnetotherapy + drugs results in faster and persistent hypotensive and analgetic effect compared to standard drug therapy, potentiates action of vascular drugs on cerebral and peripheral circulation, reduces dose of hypotensive drugs in patients with arterial hypertension and vibration disease.

Vopr Kurortol Fizioter Lech Fiz Kult. 1998 Jan-Feb;(1):16-8.

[A comparative evaluation of the effect of an extremely high-frequency electromagnetic field on cerebral hemodynamics in hypertension patients exposed in different reflexogenic areas]

[Article in Russian]

[Sokolov BA](#), [Bezruchenko SV](#), [Kunitsyna LA](#).

A single session and multiple sinocarotid and temporal exposures to EHF electromagnetic field in patients with stage I and II hypertension had different effects on cerebral circulation Variants of the above treatment are proposed.

Vopr Kurortol Fizioter Lech Fiz Kult. 1997 Jan-Feb;(1):8-11.

[Prognostic criteria of the efficacy of magnetic and magnetic-laser therapy in patients with the initial stages of hypertension]

[Article in Russian]

[Zadionchenko VS](#), [Sviridov AA](#), [Adasheva TV](#), [Demicheva OIu](#), [Bagatyrova KM](#), [Beketova IL](#).

Study of the efficacy of a course of exposures to travelling pulsed magnetic field and magnetic laser sessions in 97 patients with stages I-II essential hypertension showed a high efficacy of travelling pulsed magnetic field in patients with hyperkinetic hemodynamics and initially just slightly shifted blood rheology and platelet hemostasis. Magnetic laser therapy is more effective in patients with eukinetic and hypokinetic hemodynamics and initially sharply expressed disorders of blood rheology and platelet hemostasis.

Vopr Kurortol Fizioter Lech Fiz Kult. 1996 Mar-Apr;(2):8-10.

[The effect of a low-frequency alternating magnetic field on the autonomic nervous system in children with primary arterial hypertension]

[Article in Russian]

[Konova OM](#), [Khan MA](#).

The paper provides cardiointervalographic data assessing autonomic nervous system (ANS) function in children with primary arterial hypertension exposed to low-frequency alternating magnetic field. Favourable effects of such magnetotherapy manifest in attenuation of sympathetic and vagotonic symptoms.

Lik Sprava. 1996 Jan-Feb;(1-2):58-62.

[The clinico-biochemical, functional, immunological and cellular characteristics of the body reactions in patients with the initial stages of hypertension to the effect of a magnetic field]

[Article in Ukrainian]

[Myloslavs'kyi DK](#), [Koval' SM](#), [Sheremet MS](#).

The article presents a comprehensive evaluation of major clinical, laboratory and functional indices in the time course of magnetotherapy as well as during administration of such treatments. The most promising alternative appears to be that involving the use of immunologic and cellular parameters as markers of efficacy of therapeutic action of magnetic fields in early stages of hypertensive disease. Causes for effectiveness and ineffectiveness of the above treatment option are analyzed, approaches to eliminating those are outlined, the main indications and contraindications are determined, merits and demerits of magnetotherapy are drawn attention to.

Bioelectromagnetics. 2005 Apr;26(3):161-72.

Decreased plasma levels of nitric oxide metabolites, angiotensin II, and aldosterone in spontaneously hypertensive rats exposed to 5 mT static magnetic field.

[Okano H](#), [Masuda H](#), [Ohkubo C](#).

Department of Environmental Health, National Institute of Public Health, Tokyo 108-8638, Japan. okano@niph.go.jp

Previously, we found that whole body exposure to static magnetic fields (SMF) at 10 mT (B(max)) and 25 mT (B(max)) for 2-9 weeks suppressed and delayed blood pressure (BP)

elevation in young, stroke resistant, spontaneously hypertensive rats (SHR). In this study, we investigated the interrelated antipressor effects of lower field strengths and nitric oxide (NO) metabolites ($\text{NO}(x) = \text{NO}(2)(-) + \text{NO}(3)(-)$) in SHR. Seven-week-old male rats were exposed to two different ranges of SMF intensity, 0.3-1.0 mT or 1.5-5.0 mT, for 12 weeks. Three experimental groups of 20 animals each were examined: (1) no exposure with intraperitoneal (ip) saline injection (sham-exposed control); (2) 1 mT SMF exposure with ip saline injection (1 mT); (3) 5 mT SMF exposure with ip saline injection (5 mT). Arterial BP, heart rate (HR), skin blood flow (SBF), plasma NO metabolites ($\text{NO}(x)$), and plasma catecholamine levels were monitored. SMF at 5 mT, but not 1 mT, significantly suppressed and retarded the early stage development of hypertension for several weeks, compared with the age matched, unexposed (sham exposed) control. Exposure to 5 mT resulted in reduced plasma $\text{NO}(x)$ concentrations together with lower levels of angiotensin II and aldosterone in SHR. These results suggest that SMF may suppress and delay BP elevation via the NO pathways and hormonal regulatory systems.

Saudi Med J. 2002 May;23(5):517-20.

The effect of magneto-treated blood autotransfusion on central hemodynamic values and cerebral circulation in patients with essential hypertension.

[Alizade IG](#), [Karaveva NT](#).

Department of Cardiology, Hospital of Ministry of Internal Affairs, Baku, Azerbaijan.

OBJECTIVE: The work was carried out to study the effect of magneto-treated blood autotransfusion on the values of central and cerebral hemodynamics in patients with essential hypertension. **METHODS:** Sixty-six patients with stage II essential hypertension aged 31-60 years who underwent magneto-treated blood autotransfusion were evaluated and treated, at the Cardiology Department, Hospital of Ministry of Internal Affairs of the Azerbaijan Republic, over a period of 8 years. The diagnosis was based on clinical examination and generally accepted criteria of essential hypertension stages proposed in 1978 by the World Health Organization. **RESULTS:** Sixty-six patients with stage II essential hypertension with stable drop in blood pressure, simultaneously showed a positive clinical effect. Central hemodynamic changes in the process of magneto-treated blood autotransfusion were different and depended on the initial state of circulation. High clinical effect showed the patients with hyperkinetic type of hemodynamics. Their blood pressure were significantly lower than the patients with hypokinetic type of circulation. **CONCLUSION:** Rheoencephalographic study demonstrated that magneto-treated blood autotransfusion possessed insignificant effect on cerebral hemodynamics, mainly expressed by the reduction of arterial blood flow tension in the patients with hypokinetic type of hemodynamics.

Ter Arkh. 2001;73(10):70-3.

[Changes in blood rheological properties in patients with hypertension]

[Article in Russian]

[Shabanov VA](#), [Terekhina EV](#), [Kostrov VA](#).

AIM: To study hemorheology in patients with essential hypertension (EH), to improve EH treatment in terms of blood rheology. MATERIAL AND METHODS: Blood rheology, microcirculation, lipid plasm spectrum, central hemodynamics were studied in 90 patients with mild and 83 patients with moderate or severe EH as well as 30 healthy controls before and after treatment (hypotensive drugs, essential phospholipids, intravenous laser blood radiation, plasmapheresis). RESULTS: Hemorrhheological disorders (subnormal deformability of the red cells and elastoviscosity of their membranes, disk-spherical transformation and hyperaggregation of blood cells, high dynamic viscosity) correlated with the disease severity, arterial pressure and total peripheral vascular resistance. Long-term (1-1.5 years) hypotensive therapy, especially with combination of beta-blockers with diuretics, has a negative effect on blood rheology. Optimisation of EH treatment in terms of blood rheology consists in using essential phospholipids in stable hypertension, intravenous laser radiation in complicated hypertension, plasmapheresis in drug-resistant hypertension. Such an approach not only significantly improves hemorheology but also provides good clinical and hypotensive effects in 75-80% patients. CONCLUSION: Blood viscodynamics should be taken into consideration in individual treatment of hypertensive patients.

Biofizika. 1996 Jul-Aug;41(4):944-8.

[Effect of a "running" pulse magnetic field on certain humoral indicators and physical ability to work in patients with neurocirculatory hypo- and hypertension]

[Article in Russian]

[Orlov LL](#), [Pochechueva GA](#), [Makoeva LD](#).

The influence of "running" impulse magnetic field in patients with neurocirculatory hypo- and hypertension was studied. It has been determined that magnetotherapy in all patients increased physical load tolerability and at the same time produced different effects on hemodynamics (lowering blood pressure in hypertension and increasing it in hypotension). In patients with neurocirculatory hypotension the slightly expressed positive clinical effect was obtained, that makes "running" impulse magnetic field therapy useless in this pathology. At the same time in patients with neurocirculatory hypertension "running" impulse magnetic field therapy resulted in significant improvement of physical tolerability, improvement of patients general condition, blood pressure decrease, lowering of pressor power generation concentration, correcting effect on aldosterone blood content. These data witness for the usefulness of this method in treatment of patients with neurocirculatory hypertension.

Ter Arkh. 1996;68(5):63-7.

[The therapeutic correction of disorders in thrombocyte-vascular hemostasis and of changes in the rheological properties of the blood in patients with arterial hypertension]

[Article in Russian]

[Zadionchenko VS](#), [Bagatyrova KM](#), [Adasheva TV](#), [Timofeeva NIu](#), [Zaporozhets TP](#).

158 patients with essential hypertension received beta-adrenoblockers and were exposed to travelling impulse magnetic field, magnetolaser radiation. The study of platelet-vessel hemostasis and blood rheology revealed a relation of good clinical response and increased exercise tolerance with initial platelet dysfunction and rheological disorders which underwent positive changes in the course of treatment.

Vopr Kurortol Fizioter Lech Fiz Kult. 1994 Jan-Feb;(1):8-9.

[The efficacy of low-intensity exposures in hypertension]

[Article in Russian]

[Kniazeva TA](#), [Otto MP](#), [Markarov GS](#), [Donova OM](#), [Markarova IS](#).

One hundred hypertensive subjects with labile and stable disease were exposed to low-intensity low-frequency electrostatic field generated by the unit "Infita-A". In labile hypertension, the field produces a hypotensive effect, improves myocardial contractility, increases myocardial and coronary reserves due to reduced peripheral resistance and stimulation of myocardial propulsion. Therapeutic response to the treatment is attributed to normalization of deep brain structure functioning.

Vopr Kurortol Fizioter Lech Fiz Kult. 1994 May-Jun;(3):10-2.

[The effect of the joint use of plasmapheresis and magnetic treatment of the blood on the indices of blood rheology and hemodynamics in hypertension patients]

[Article in Russian]

[Alizade IG](#), [Karaeva NT](#).

The results are presented obtained on combined application of plasmapheresis and magnetic blood treatment as regards hemorheology and hemodynamics in 41 patients

with essential hypertension stage II. The course introduction of the above combined treatment led to positive shifts in arterial pressure irrespective of the patients' hemodynamic type, in blood density, elasticity and dynamic properties.

Ter Arkh. 1993;65(1):44-9.

[The comparative efficacy of nondrug and drug methods of treating hypertension]

[Article in Russian]

[Ivanov SG.](#)

Effectiveness of some physical therapeutic factors (constant magnetic field, impulse currents) and new hypotensive drugs (tobanum, prinorm, ormidol, minipress, arifon, arilix) was compared in the treatment of essential hypertension stage II. It is suggested that nonpharmaceutical therapy can regulate functions, correct hemodynamic and microcirculatory disorders, produce therapeutic effect without side effects typical for drugs.

Vopr Kurortol Fizioter Lech Fiz Kult. 1992 May-Jun;(3):14-7.

[Magnetotherapy in obliterating vascular diseases of the lower extremities]

[Article in Russian]

[Kirillov IuB,](#) [Shval'b PG,](#) [Lastushkin AV,](#) [Baranov VM,](#) [Sigaev AA,](#) [Zueva GV,](#) [Karpov EI.](#)

The investigators have developed a polymagnetic system "Aurora-MK-01" employing running impulse magnetic field to treat diseases of the leg vessels by the action on peripheral capillary bed. At a pregangrene stage a positive effect on peripheral capillaries was achieved in 75-82% of the patients treated

Lik Sprava. 1992 Oct;(10):32-5.

[A comparative evaluation of the efficacy of quantum methods for treating hypertension patients]

[Article in Ukrainian]

[Nykul TD,](#) [Karpenko VV,](#) [Voitovykh NS,](#) [Karmazyna OM.](#)

A study is presented of the effect of laser and microwave resonance therapy on the hemodynamics and hemorheology in 56 patients with hypertensive disease. The hypotensive effect of intravascular laser therapy is related to the positive changes, reduction of blood viscosity and general peripheral vascular resistance. The effect of low molecular electromagnetic radiation on acupuncture points favoured clear reduction of peripheral vessel resistance. Combination of laser and microwave resonance therapy produces a positive effect due to potentiation of these methods and, thus, influencing the systems of hemodynamics, hemostasis and hemorheology.

Kardiologiia. 1991 Feb;31(2):67-70.

[Optimization of the treatment of patients with hypertensive disease from the rheological viewpoint]

[Article in Russian]

[Shabanov VA](#), [Kitaeva ND](#), [Levin GIa](#), [Karsakov VV](#), [Kostrov VA](#).

The efficacy of various modes of correcting rheological disorders (membrane-protective agents, laser irradiation, plasmapheresis) was compared in hypertensive patients. In 30% of the patients, the conventional antihypertensive therapy was demonstrated to deteriorate hemorheological parameters, which was due to its atherogenic impact on the blood lipid spectrum. Essential phospholipids, laser irradiation, and plasmapheresis, which are supplemented to the multimodality therapy promote a significant improvement of hemorheological parameters, which makes it possible to recommend them for management of hypertensive patients with a stable (essential phospholipids), complicated (laser irradiation), and refractory (plasmapheresis) course.

Khirurgiia (Mosk). 1990 Nov;(11):41-3.

[Outpatient electromagnetic therapy combined with hyperbaric oxygenation in arterial occlusive diseases]

[Article in Russian]

[Reut NI](#), [Kononova TI](#).

The authors first applied hyperbaric oxygenation (HBO) in the outpatient clinic in 1968. Barotherapy was conducted in 107 outpatients whose ages ranged from 27 to 80 years; they had various stages of the disease of 5- to 20-year history. In 70 patients treated for obliterating diseases of the vessels by HBO in a complex with magnetotherapy by means of magnetophors, the remission lasted 1-2 years; patients treated by HBO alone had a 3-8 month remission. A prolonged positive effect was produced in 64 patients. The suggested

effective and safe method is an additional one to the existing means of treating this serious and progressive disease, which can be applied successfully in outpatient clinics.

Ter Arkh. 1990;62(9):71-4.

[The magnetotherapy of hypertension patients]

[Article in Russian]

[Ivanov SG](#), [Smirnov VV](#), [Solov'eva FV](#), [Liashevskaja SP](#), [Selezneva LIu](#).

A study was made of the influence of the constant MKM2-1 magnets on patients suffering from essential hypertension. Continuous action of the magnetic field, created by such magnets, on the patients with stage II essential hypertension was noted to result in a decrease of arterial pressure without the occurrence of any side effects and in a simultaneous reduction of the scope of drug administration. Apart from that fact, magnetotherapy was discovered to produce a beneficial effect on the central hemodynamics and microcirculation. The use of the MKM2-1 magnets may be regarded as a feasible method of the treatment of essential hypertension patients at any medical institution.

Patol Fiziol Eksp Ter. 1989 May-Jun;(3):59-61.

[Changes of central hemodynamics in rats with spontaneous hypertension under the effect of a low-frequency magnetic field]

[Article in Russian]

[Buiavykh AG](#), [Stukanov AF](#).

It was established that a course of exposures of the renal region of rats with spontaneous hypertension to the effect of low-frequency magnetic field influenced the central hemodynamic parameters significantly, which was displayed by reduction of total peripheral vascular resistance and normalization of the cardiac output.

Vopr Kurortol Fizioter Lech Fiz Kult. 1998 Jul-Aug;(4):31-6.

[The combined action of infrared radiation and permanent and alternating magnetic fields in experimental atherosclerosis]

[Article in Russian]

[Zubkova SM](#), [Varakina NI](#), [Mikhailik LV](#), [Bobkova AS](#), [Maksimov EB](#).

Paravertebral exposure to infrared radiation (0.87 micron, 5 mW) and permanent magnetic field in combination with one- and two-semiperiodic alternative magnetic fields (50 Hz, 15-30 mT) was studied in respect to the action on adaptive reactions in animals with experimental atherosclerosis. Complex consisting of infrared radiation, permanent magnetic field and one-semiperiodic pulse alternative magnetic field was most effective in restoration of vasomotor-metabolic and immune disturbances accompanying development of atherosclerosis.

Vopr Kurortol Fizioter Lech Fiz Kult. 1992 May-Jun;(3):14-7.

[Magnetotherapy in obliterating vascular diseases of the lower extremities]

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Vestn Khir Im I I Grek. 1996;155(5):37-9.

[The potentials of laser and electromagnetic-laser therapy in the treatment of patients with arteriosclerosis obliterans of the vessels of the lower extremities]

[Article in Russian]

[Galimzianov FV.](#)

A comparative analysis of the laser and electromagnetic laser therapy was performed in the complex treatment of patients with obliterating atherosclerosis of the lower extremity vessels. Laser treatment exerts a therapeutic effect related with its influence upon microcirculation. The effectiveness of complex treatment becomes higher when using a combination of laser therapy with the impulse electromagnetic therapy of complex modulation at the expense of improvement of the regional blood circulation in all links of the vasculature.

Vopr Kurortol Fizioter Lech Fiz Kult. 1993 Sep-Oct;(5):22-5.

[The use of magnetics and laser therapy in treating obliterating vascular diseases of the extremities]

[Article in Russian]

[Kirillov IuB, Shval'b PG, Lastushkin AV, Sigaev AA, Kachinskii AE, Shashkova SN.](#)

The paper presents the results of treatment received by 60 patients suffering from lower limb vascular obliteration stage IIA-III. The treatment involved combined use of magnetic field and laser irradiation. Peripheral circulation and central hemodynamics were evaluated rheographically and using ultrasound Doppler sphygmomanometry. Combined application of the above two modalities produced a greater effect on central hemodynamics compared to them introduced alone.

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