

The state of the hemodynamic parameters of the eye
in patients with optic nerve atrophy of vascular origin when using
in the complex treatment of bioresonance therapy V.V.

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Despite the achieved success in the complex treatment of optic nerve atrophy (ADS), the level of disability in this disease remains high to date and amounts to 11% [5, 7].

In the structure of blindness and low vision in ADH, the atrophic process of the optic nerve of vascular origin occupies a leading position [4, 8].

Based on the modern phasotonic neurodynamic model of regulation of organismic, organ vascular-trophic and metabolic homeostasis [1, 2], we believe that the use of bioresonance therapy (BRT) in the treatment of ADN of vascular etiology is a promising direction. Its medicinal advantages include the ability to cause consistency of the patient's body biorhythms with organ biorhythms and with the rhythms of the environment. This ensures the integral interaction of all regulatory systems of the body, including the cellular and molecular levels, as well as the synchronization of capillary blood flow and cell energetics, especially in the place of localization of the pathological process [3].

Purpose of the work: analysis of hemodynamic parameters in the vessels involved in the blood supply of the optic nerve (MN), when using the BRT method in the complex treatment of ADS of vascular genesis.

Material and methods

The object of the study was 36 patients (41 eyes) with partial ADF, which arose after the transferred anterior (30 people - 33 eyes) and posterior (6 people - 8 eyes) ischemic neuroopticopathy.

The age of the patients varied from 56 to 67 years (average 62.4 ± 4.5 years). The duration of the disease ranged from 6 months to 2 years.

All patients were examined by a therapist, neurologist. Magnetic resonance imaging of the brain and orbits, ultrasound Doppler ultrasonography of intracranial and intraocular blood vessels were performed.

Based on the examination results, general atherosclerosis was diagnosed in 20 people, hypertension - in 28, coronary heart disease - in 19 people.

According to MRI data, atherosclerosis of the internal carotid arteries and its branches without petrification occurred in 21 patients, carotid-ophthalmic petrification was revealed in 10 patients.

All examined patients were divided into two groups depending on the received treatment.

The control group of the study consisted of 16 patients (18 eyes). For 10 days they underwent standard therapy, including: intravenous infusion of a 5% solution of Mexidol 4.0 ml, which improves rheological parameters of blood, microcirculation and energy metabolism; intramuscular injections of cortexin 10 mg to correct metabolic processes in the MN;

parabulbar injections of 50 mg mildronate, which helps redistribute blood flow in favor of the ischemic zone, restore energy reserves, and correct free radical oxidation processes [6, 9, 10]; transcutaneous electrical stimulation ZN (BSES ZN) on the device "ESOM" (Russia, Ufa) in the usual mode.

The main research group consisted of 20 patients (23 eyes). In addition to the aforementioned medical and physiotherapeutic procedures, they received a course of BRT for 10 days. BRT sessions were carried out using the hardware and software complex "IMEDIS-EXPERT" by "IMEDIS" (Russia, Moscow).

Endogenous BRT was performed in the organotropic program mode, sequentially along the meridians of nervous degeneration and blood circulation. During this procedure, plate electrodes were placed on the closed eyelids and connected to the "BRT" socket of the hardware-software complex.

Simultaneously with it, exogenous BRT (frequency electromagnetic therapy) was carried out, in which the "loop" electrode was placed over the plate electrodes and connected to the socket for frequency electromagnetic therapy.

The selection of frequency programs for exogenous BRT was carried out individually before each treatment session using the autonomic resonance test (ART). To activate the vascular-trophic function in the MN, the frequency programs E31, E5, E242, E199, E102 of the device were initially applied in an automatic mode (the duration of each program was 2 minutes), which contributed to the restoration of the natural neurophysiological circuit of autoregulation of intraocular blood flow and its synchronization with the body biorhythms of blood flow. Then we used the electromagnetic frequencies from the programs E67, E77, E154, E173, E386 in order to create the best metabolic conditions for rhythmic excitation in the axons of the MN. The duration of BRT was 20 minutes on average. Immediately after the end of the BRT session, the patients of the main group received drug therapy,

The study of hemodynamic parameters in the vessels involved in the blood supply to the MN - the orbital artery (GA), the central retinal artery (CAC) and the posterior short ciliary arteries (PACA), was performed before treatment, immediately after the end of the course of treatment and then after 3, 6, and 12 months using the multifunctional ultrasound complex "Logiq E" (USA). At the same time, the systolic (V_s , cm / s) and diastolic (V_d , cm / s) blood flow velocity, as well as the resistance index (Ri) in GA, CAC, and PCCA were recorded.

A variant of the norm were hemodynamic parameters in these vessels, obtained in 7 somatically and ophthalmologically healthy people (14 eyes) aged 55 to 65 years (mean age 59.0 ± 5 years).

Results and discussion

The table shows the indicators of the dynamics of ocular blood flow in the studied vessels of healthy people and patients with ADF of vascular etiology before treatment and with various methods of treatment after 10 days, 3, 6, 12 months.

table

Dynamics of ocular blood flow in patients with ADS of vascular etiology
with different methods of treatment

Indicators Norm		Main group, n = 23 eyes					Control group, n = 18 eyes				
		Before treatment	After treatment				Before treatment	After treatment			
			ten days	3 months	6 months	12 months		ten days	3 months	6 months	12 months
GA Vs, M ± m, cm / s, Vd, M ± m, cm / s Ri, M ± m	30.0 ± 0.7 9.3 ± 0.1 0.62 ± 0.02	24.3 ± 1.2 8.0 ± 0.9 0.74 ± 0.03	30.7 ± 0.4* 11.1 ± 0.12 0.63 ± 0.01	31.2 ± 0.15 10.0 ± 0.08 0.62 ± 0.01	31.0 ± 0.11 10.2 ± 0.05 0.05 ± 0.63 0.01	27.0 ± 1.05 8.5 ± 0.12 0.68 ± 0.01	25.0 ± 1.1 8.3 ± 0.4 0.73 ± 0.1	28.5 ± 0.3 8.7 ± 0.2 0.69 ± 0.01	26.7 ± 0.09 8.2 ± 0.03 0.7 ± 0.02	25.1 ± 0.7 8.1 ± 0.05 0.73 ± 0.03	25.0 ± 0.2 8.0 ± 0.11 0.73 ± 0.02
CAC Vs, M ± m, cm / s Vd, M ± m, cm / s Ri, iM ± m	10.9 ± 0.3 3.0 ± 0.11 0.67 ± 0.01	9.0 ± 0.5 1.9 ± 0.07 0.79 ± 0.02	13.2 ± 0.08 2.7 ± 0.02 0.65 ± 0.005	14.0 ± 0.09 2.8 ± 0.01 0.66 ± 0.02	13.7 ± 0.15 2.8 ± 0.01 0.65 ± 0.01	10.5 ± 0.08 2.3 ± 0.09 0.69 ± 0.04	9.1 ± 0.11 2.0 ± 0.01 0.78 ± 0.02	11.1 ± 0.09 2.1 ± 0.02 0.69 ± 0.001	11.9 ± 0.07 2.5 ± 0.01 0.72 ± 0.02	9.5 ± 0.2 2.2 ± 0.01 0.76 ± 0.01	9.2 ± 0.07 1.9 ± 0.05 0.76 ± 0.02
ZKTA Vs, M ± m, cm / s Vd, M ± m, cm / s Ri, M ± m	15.0 ± 0.9 3.8 ± 0.02 0.66 ± 0.02	9.41 ± 0.44 2.1 ± 0.05 0.77 ± 0.03	13.8 ± 0.15* 3.9 ± 0.1 0.64 ± 0.02	14.0 ± 0.11* 4.0 ± 0.02 0.63 ± 0.01	13.9 ± 0.09 4.1 ± 0.05 0.65 ± 0.01	10.5 ± 0.12 3.2 ± 0.1 0.67 ± 0.009	9.5 ± 0.22 2.0 ± 0.01 0.76 ± 0.01	11.5 ± 0.11 2.7 ± 0.05 0.66 ± 0.04	12.0 ± 0.1 3.0 ± 0.03 0.68 ± 0.01	10.0 ± 0.11 2.1 ± 0.03 0.74 ± 0.01	9.3 ± 0.05 2.1 ± 0.02 0.74 ± 0.01

Note: * - reliability of intergroup differences ($p < 0.05$).

Analysis of hemodynamic parameters in patients with ADF of both study groups before treatment showed almost the same decrease relative to the norm. Thus, the level of Vs decrease in GA was 19.0%, CAC - 17.4% and WCCA - 30.6%. The decrease in Vd was, respectively: 13.9%, 36.6%, 44.7%. In parallel, an increase in Ri relative to the norm, respectively, from 19.3 to 16.6% ($p < 0.05$) was observed in all studied blood vessels.

The data obtained confirm the significant role of decreased ocular blood flow in the development of ADN of vascular etiology.

After the completion of the complex course of treatment in all patients of the main study group, a pronounced hemodynamic effect was recorded in the form of a statistically significant increase relative to the initial level of Vs and Vd indicators in GA - by 26.4% and 38.7%, in CAS - by 46.6% and 44.4%, in CCA - by 33.2% and 46.1%, respectively. At the same time, a decrease in Ri was observed in all studied blood vessels in comparison with the initial data, which indicated an improvement in the vascular-trophic activity of the optic-nervous apparatus of the eye.

These hemodynamic parameters in the studied vessels in the patients of the main study group remained reliably ($p < 0.05$) stable during the next 6 months of observation and only by 12 months after treatment they became

gradually decline. However, the values studied speed indicators hemodynamics remained higher, and the peripheral resistance index was lower than the baseline data before treatment.

In patients in the control group of the study, after the end of the course treatment, the number of patients with an improvement in the velocity parameters of blood flow and Ri was noted in 72.2% of patients (1.4 times less than in the main group). The average speed indicators of hemodynamics in the vessels involved in the blood supply to the MN were lower than in the main group: in the GA - by 10.8 - 12.8%, in the CAC - by 12.3 - 12.9%, in the CCA - by 11.1 - 10.8%.

In the course of dynamic observation, a decrease in Vs and Vd in patients of the control group was revealed from 3 months after treatment, and by 6 months all the studied hemodynamic parameters were practically equal to the initial data.

Conclusion

The hemodynamic parameters obtained in a comparative study in the vessels supplying the MN, with various methods of treating ADN of vascular etiology, indicate the ability of the BRT method as part of a complex therapy to optimize the effectiveness of treatment.

The use of BRT in the complex treatment of patients with ADF of vascular etiology is pathogenetically expedient and allows to achieve an improvement in hemodynamic parameters in the vessels supplying the MN, and due to the effect of "tissue memory" ensures their stability for 6 months or more, in contrast to traditional methods of conservative therapy.

Literature

1. Gotovsky Yu.V., Kosareva LB, Blinkov I.L., Samokhin A.V. Exogenous bioresonance therapy with fixed frequencies (guidelines) - M.: IMEDIS, 2010. - 152 p.
2. Gotovsky M.Yu., Perov Yu.F., Chernetsova LV. Biophysical mechanisms therapeutic effect of bioresonance therapy. Modern concepts and probabilistic models // Traditional medicine. - 2008. - No. 1. - P.4-17.
3. Gotovsky M.Yu., Perov Yu.F., Chernetsova LV. Bioresonance therapy. - M.: IMEDIS, 2010. -- 152 p.
4. Egorov V.V., Smolyakova G.P., Solovieva Yu.B. Diseases of the visual tract: textbook. manual on eye diseases for students of the postgraduate system. prof. education of doctors: recommended by UMO. - Khabarovsk, 2007. -- 135 p.
5. Morozov VI, Yakovlev AA Diseases of the visual pathway. Clinic. Diagnostics. Treatment. - M.: Publishing house Binom, 2010. -- 650 p.
6. Neuroprotection in acute and chronic cerebral insufficiency circulation / ed. A.A. Skoromtsa, M.M. Dyakonov. - SPb.: Nauka, 2007. -- 200 p.
7. Povalyaeva D.A., Sorokin E.L., Danilova L.P. et al. Clinical Research the effectiveness of complex treatment of partial atrophy of the optic nerve // Bulletin of the Tambov University. Series: Natural and technical sciences // 2014. - V. 19, No. 4. - pp. 1196-1200.
8. Tarasova L.N. Eye ischemic syndrome / L.N. Tarasova, T.N. Kiseleva, A.A. Fokin. - M.: Medicine, 2003. -- 176 p.
9. Fedin A.I., Rummyantseva S.A. Intensive care for ischemic stroke. - M.: Medical book, 2004. -- 284 p.

10. Yakovlev V.A. Mexidol in the complex therapy of alcohol dependence (manual for psychiatrists-narcologists). - M., 2004 .-- 26 p.

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