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# NEW DAY IN MEDICINE

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## RESULTS OF TREATMENT OF PATIENTS WITH INITIAL FORMS OF CEREBROVASCULAR DISEASES

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✓ ***Resume***

***In patients with cerebrovascular pathology endonasal electrophoresis with ceruloplasmin has a positive effect on hemodynamics, bioelectrical activity of the brain, favourably affects lipid metabolism and functional state of the central nervous system, reduces the severity of neurological deficit.***

***Key words: cerebrovascular diseases, ceruloplasmin, endonasal electrophoresis***

## РЕЗУЛЬТАТЫ ЛЕЧЕНИЯ ПАЦИЕНТОВ С НАЧАЛЬНЫМИ ФОРМАМИ ЦЕРЕБРОВАСКУЛЯРНЫХ ЗАБОЛЕВАНИЙ

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✓ ***Резюме***

***У пациентов с цереброваскулярной патологией эндоназальный электрофорез с церулоплазмином оказывает положительное влияние на гемодинамику, биоэлектрическую активность головного мозга, благоприятно воздействует на липидный обмен и функциональное состояние центральной нервной системы, уменьшает выраженность неврологического дефицита.***

***Ключевые слова: цереброваскулярные заболевания, церулоплазмин, эндоназальный электрофорез***

## SEREBROVASKULYAR KASALLIKLARNING BOSHLANG'ICH SHAKLLARI BO'LGAN BEMORLARNI DAVOLASH NATIJALARI

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✓ ***Rezyume***

***Serebrovaskulyar patologiyasi bo'lgan bemorlarda seruloplazmin bilan endonazal elektroforez gemodinamikaga, miyaning bioelektrik faolligiga ijobiy ta'sir ko'rsatadi, lipid metabolizmiga va markaziy asab tizimining funktsional holatiga foydali ta'sir ko'rsatadi va nevrologik yetishmovchilikning og'irligini kamaytiradi.***

***Kalit so'zlar: serebrovaskulyar kasalliklar, seruloplazmin, endonazal elektroforez***

**Relevance**

Cerebrovascular diseases occupy one of the leading places in the structure of morbidity, disability and mortality [18, 19, 20]. Initial forms of cerebral circulatory disorders are a common neurological condition affecting creativity, performance and quality of life [12, 13].

Today, there are many good, effective medications that can correct the changes in the body, but they are not always available or the method of administration is not comfortable [6]. Using physiotherapeutic methods of drug administration, it is possible to eliminate these difficulties to some extent. Thus, under the action of electric current, drugs in endonasal administration penetrate through the nasal mucosa, travelling pereneurally and along the lymphatic pathways, enter the liquor of the subarachnoid space and have an effect primarily on the hypothalamus [5, 15, 16].

Among the pharmacological agents used in neurology to correct metabolic changes, a drug isolated from blood plasma proteins - ceruloplasmin (KF 1.16.3.1) - a copper-containing enzyme of the alpha-globulin fraction of blood serum - began to be used [11].

This is probably due to the fact that the content of ceruloplasmin in serum decreases in syringomyelia, multiple sclerosis, amyotrophic lateral sclerosis, and cerebral atherosclerosis [2, 23].

Ceruloplasmin is the main blood antioxidant; the drug stimulates haemopoiesis (red blood formation), reduces intoxication and immunosuppression, binds superoxide radicals and prevents lipid peroxidation of cell membranes [14, 17]. The drug is also used in the complex therapy of patients with early clinical forms of cerebral circulatory disorders [1, 24].

There is an intravenous drip method of drug administration; it is effective, but it is not comfortable enough and requires certain material costs [8, 10]. For more effective use of the drug we proposed a method of treatment with ceruloplasmin (rationalisation proposal No. 4 dated 17.11.97 "Method of treatment of patients with initial manifestations of cerebral atherosclerosis by transnasal electrophoresis with ceruloplasmin") - endonasal electrophoresis.

The main purpose of our study was to organise and study the effectiveness of treatment of patients with early clinical forms of cerebral circulatory disorders by endonasal electrophoresis with ceruloplasmin, a preparation of copper-containing enzyme of the alpha-globulin fraction of blood serum. We conducted a dynamic study of the effect of ceruloplasmin in 80 patients with initial manifestations of cerebral circulatory disorders (36) and dyscirculatory encephalopathy I-II degree (44), the average age of which was 46 years. The control group consisted of 30 practically healthy individuals and 10 people of the comparison group with the initial manifestation of cerebral circulation disorder and dyscirculatory encephalopathy, who received endonasal electrophoresis of 0.9% sodium chloride. Each patient before and after treatment was thoroughly examined clinically with assessment of general condition and neurological status. Neuropsychological examination with standardised assessment of cognitive impairment; haemodynamic parameters (blood pressure, rheovasography and rheoencephalography on the computer rheograph "Rheo-Spectrum" by "NeuroSoft": ultrasound Dopplerography and transcranial Dopplerography of the main arteries of the head were performed on ultrasound Doppler systems "Sonicaid Vasonflo 4" (firm "Oxford Sonicaid", England) and "Companion" (firm "EME-Nicolet", Germany USA); ultrasound Doppler scanning - on ultrasound scanner "Sonoline SI 450" (firm "Siemens", Germany). A 16-channel encelograph (manufactured in Hungary) was used to record brain bioelectrical potentials. The classification [9] with characterisation of alpha-, betta-, slow- and fast-wave activity was used to evaluate the obtained results. The following Doppler parameters were evaluated: linear blood flow velocity, pulsation index [22], characterising the level of circulatory resistance of the distal channel; hypercapnia reactivity coefficient [7], characterising the vasodilator reserve; hypocapnia reactivity coefficient [7], characterising the vasoconstrictor reserve; vasomotor reactivity index [25], characterising the range of metabolic reactivity of cerebral vessels. Ultrasound marker of atherosclerotic lesion of the main arteries of the head was thickening and thickening of the intima-media complex more than 1 mm.

Ceruloplasmin was administered by endonasal electrophoresis, daily with a course duration of 10-15 days, during which other methods were excluded. Endonasal electrophoresis with 2% ceruloplasmin solution was performed from both poles alternately, the current strength was increased from 0.5 mA at the first procedure to 2 mA at the fifth and further with this strength; the duration of the procedure was increased from 10 to 20 minutes [3, 4, 21].

The patients tolerated the treatment well, no side effects were detected. The majority of patients (80%) had a positive effect in the form of: a decrease in the severity of general weakness, headache, dizziness, noise in the head, autonomic dysfunction, improved memory, efficiency. There was a tendency towards normalisation of blood pressure, rheoencephalographic indicators. Thus, 65% of the patients showed normalisation of responses to functional tests. Electroencephalography clearly marked an increase in the expression of alpha rhythm and a decrease in the expression of slow waves. Dynamics of blood parameters - erythrocyte content, leukocytes, haemoglobin, erythrocyte sedimentation rate was not revealed, but the tendency of cholesterol reduction was distinct. In patients with dyscirculatory dystonia the severity of neurological deficit is reduced. Significant positive dynamics was noted in the indicators of ultrasound study of cerebral blood supply.

The analysis of Doppler parameters of cerebral circulation in the main group and control showed that there were no significant differences in velocity characteristics and level of resistance of the resistive channel of cerebral circulation in patients with early clinical forms of cerebral circulatory disorders in comparison with control; the most significant shifts in patients with early clinical forms of cerebral circulatory disorders in comparison with control were observed in the autoregulation system; the range of metabolic reactivity of cerebral vessels was increased mainly due to the increase in vasodilator reserve; the most significant effect of treatment was observed in patients with early clinical forms of cerebral circulatory disorders in comparison with control. After treatment, the range of vasomotor reactivity of cerebral vessels expanded mainly due to an increase in vasodilator reserve; the most pronounced effect of treatment was observed in patients with early clinical forms of cerebral circulatory disorders aged under 40 years. Shifts in the autoregulation system were most pronounced in patients with early clinical forms of cerebral circulatory disorders up to 40 years of age.

It should be noted that the best results were obtained with initial cerebral circulatory insufficiency and with dyscirculatory encephalopathy of the first degree and at a younger age.

Catamnestic study showed persistence of the therapeutic effect, many patients requested to repeat the course of treatment within 4-6 months.

## Conclusion

This method of treatment (endonasal electrophoresis with ceruloplasmin) of patients with cerebrovascular pathology has a positive effect on hemodynamics, including influencing the autoregulatory system of cerebral circulation, bioelectrical activity of the brain, favourably affects lipid metabolism and the functional state of the central nervous system, reduces the severity of neurological deficit, to recommend it in neurological practice.

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