

Cerebrovascular Insufficiency

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[The treatment of patients with chronic cerebral circulatory failure by using laser puncture and the microclimate of the biotron]

[Article in Ukrainian]

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A mode is proposed of treatment of chronic cerebrovascular disorders, such as initial manifestations of cerebral blood supply insufficiency (IMBSI) and dyscirculatory encephalopathy (DE) stage I-II in hypertensive disease, involving the use of laser puncture and microclimate of biotron. All patients (n = 162) were exposed to laser puncture (10-12 procedures). Laser puncture treatments were devised according to classical approaches of reflexotherapy, using determinants of electropuncture diagnostic method by Riodoraku. The treatments were carried out with the aid of infrared portable laser "Biomed-001". IMBSI patients presenting with vegetovascular dystonia and about 70% of IMBSI patients presenting with hypertensive disease derived benefit from a course of laser puncture, as evidenced by REG, EEG, acupuncture diagnosis, iridodiagnosis according. In DE stage I-II patients and about 30% IMBSI patients presenting with hypertensive disease good therapeutic effect occurred after treatment in a ward with a stable microclimate of biotron. The proposed method can be used for treating chronic cerebrovascular disorders and administering stroke prophylaxis.

IN-VEIN LASER BLOOD IRRADIATION (ILBY) IN COMPLEX TREATMENT FOR PATIENTS WITH CHRONIC CEREBRAL VASCULAR INSUFFICIENCY (CCVI)

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Autoregulation of cerebral circulation is a complex process which is in many ways affected by the resistability of the cerebral arteries walls. In its turn it depends on pH (tension of hydrogen ions) in arterial blood, blood sticking and deformation of erythrocytes. The increase of blood sticking and reduction of the deformation of erythrocytes worsen the microcirculation. A lot depends on senile changes of cerebral arteries - accumulation of β -lipoproteins and pre- β lipoproteins in plasma. The disorganisation of cerebral blood circulation causes a functional defect much quicker and sharper than in other organs. Therefore, correction of blood rheology is considered to be of great importance. The use of helium-neon laser radiation of low intensity leads to

lowering the level of blood cells spontaneous aggregation, to the growth of erythrocyte deformity and the reduction of dyslipidemia. ILBI was included into the complex treatment of 136 patients with chronic, cerebral vascular insufficiency (CCVI). 21,3% of them suffered from vegetative dystonia. 14,7% had initial symptoms of cerebral vascular insufficiency with cervical osteochondrosis, cerebral arteriosclerosis, hypertension. 35,3% had discirculatory encephalopathy (1-11 degree), 28,7% were in the period of rehabilitation after cerebral decirculation (from 3 weeks to 1 year). The treatment was performed with ALOC-1 and ALOY-2 (radiation wavelength - 630 nm with the light-guide output power 1,3-3mW during 15-30 minutes). The drug therapy included angioprotectors, desagregants, vasodilators. Compared with the patients "who had only drug treatment, the patients under the experiment experienced much slighter headaches, giddiness and cerebral noise, increase of tolerance to loading, better concentration of attention and memory, regress of neurological signs correlation with normalization of indexes of hemorheology and hemostasis. The indexes of cholesterol, triglycerides and phybrinogen were lower. The analysis of the results received has proved the efficiency of the use of ILBI in complex treatment for patients with CCVI.

INTRAVASCULAR LASER THERAPY ON THE CEREBRAL CIRCULATION ISCHEMIC DISTURBANCES

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The dynamics of clinical and pathophysiological alterations on the various forms of cerebral circulation ischemic disturbances (CCID) was investigated in the course of helium-neon laser therapy (HNL). There were treated 600 patients. Clinical, vegetative, and neurophysiological pattern indices were examined. Results of the complex investigation reliably testified that vegetative indices play the important role in CCID pathogenesis, accompanied by pathologic neuro-dynamic disbalance formation. Patients with phase somatovegetative hyperactivity prevailed. Clinical effect of HNL correlated with system vegetative dynamic, its effectiveness was higher in the patients with initial sympathicotonia. HNL was not effective on cholinergic influences. After HNL positive neuro-physiological changes were registered in patients with initial adrenergic activity, there were no changes at cholinergic intensity or slight modulate effect was observed. HNL improved blood circulation, blood filling was increased in the affected vascular basin, the increased cerebral arteries tone decreased, pulse blood filling increased, venous circulation was improved. Therefore, HNL has neurodynamic effect, relaxes sympathicotonic influences and has vagotrope regulatory effect. Photoneurodynamic HNL influence renders trophotroimages action, preventing or reducing cerebral tissue ischemization at all stages of cerebro-vascular diseases with sympatic pattern and is not expedient on neurodynamic disbalance in the form of parasympathicotonia. HNL allows to receive stable therapeutic effect in patients with initial cerebral blood supply insufficiency, transient disturbances of cerebral blood circulation, slight insult, ischemic insult in the acute phase, discirculatory encephalopathy at the first stage.

Treatment of experimentally induced transient cerebral ischemia with low energy laser inhibits nitric oxide synthase activity and up-regulates the expression of transforming growth factor-beta 1.

Leung MC, Lo SC, Siu FK, So KF

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BACKGROUND AND OBJECTIVES: Nitric oxide (NO) has been shown to be neurotoxic while transforming growth factor-beta 1 (TGF-beta1) is neuroprotective in the stroke model. The present study investigates the effects of low energy laser on nitric oxide synthase (NOS) and TGF-beta1 activities after cerebral ischemia and reperfusion injury. **STUDY DESIGN/MATERIALS AND METHODS:** Cerebral ischemia was induced for 1 hour in male adult Sprague-Dawley (S.D.) rats with unilateral occlusion of middle cerebral artery (MCAO). Low energy laser irradiation was then applied to the cerebrum at different durations (1, 5, or 10 minutes). The activity of NOS and the expression of TGF-beta1 were evaluated in groups with different durations of laser irradiation. **RESULTS:** After ischemia, the activity of NOS was gradually increased from day 3, became significantly higher from day 4 to 6 ($P < 0.001$), but returned to the normal level after day 7. The activity and expression of the three isoforms of NOS were significantly suppressed ($P < 0.001$) to different extents after laser irradiation. In addition, laser irradiation was shown to trigger the expression of TGF-beta1 ($P < 0.001$). **CONCLUSIONS:** Low energy laser could suppress the activity of NOS and up-regulate the expression of TGF-beta1 after stroke in rats.

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