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THE EFFECTIVENESS OF NEUROPROTECTIVE THERAPY IN ISCHEMIC STROKE

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Annotation: 54 patients have been examined with ischemic stroke in the early recovery period. They have gone through clinic-instrumental and neuropsychologic examination. In comprasion with cerebrolysin at the dose of 10,0 ml and 30,0 ml, 30 ml dose of cerebrolisyn effected positively to intellectual-amnestic disorders, by developing its neuroprotective action. In addition, at this dose of medicine, brain bioelectrical activity has been improved faster in EEG.
Key words: ischemic stroke, cerebrolysin, EEG, neuroprotection, neuropsychologic, examination.

Relevance. The problem of post-stroke cognitive impairment (PSCI) is today the subject of research by many scientists, since it is relevant for almost all the countries in the world. The prevalence of stroke and dementia continues to rise. There are currently 47.8 million people with dementia in the world. Its prevalence is expected to double every 20 years. It is estimated that by 2030 the number of patients with dementia will increase to 75 million and by 2050 to 131 million; of these, 70% will be from low- and middle-income countries. PSCI - is any cognitive disorder that is temporarily associated with a stroke. Early PICIs are detected in the first 3 months after stroke, late PSCI s - in the period from 3 months to 1 year, but no later than one year after the development of a stroke. The later, after a stroke, cognitive impairments are detected, the less obvious their direct connection with stroke becomes. Cognitive impairment occurs in 16-60% of patients within a year after a stroke. As early as 6 months after stroke, PICI of varying severity is detected in almost half of the patients [1,2].

Taking into account the concept of "therapeutic window", the delay of irreversible brain damage in acute vascular catastrophe has been proven. In ischemic stroke, early prescription of neuroprotective agents in combination with reperfusion allows one to expect a greater effect of therapy [7]. Residual effects after a stroke are detected in about 2/3 of patients, of which 50% have cognitive impairments that limit social adaptation, including work and self-care in everyday life, even in the absence of significant movement disorders [5,6]. Most often, mild to moderate cognitive impairment occurs, in most cases amenable to correction and recovery with the timely appointment of appropriate therapy [3,4]. Neuroprotection, which can be carried out at any stage of medical care for patients with acute cerebrovascular accident, is of great importance in drug therapy in patients with stroke.

Qualitative diagnostics of cognitive impairments should include neuropsychological research, since the first manifestations of this disease are psychoemotional disorders and the most disabling consequences are associated precisely with higher mental disorders. And therefore, in the therapeutic correction of ischemic stroke, great importance is attached to drugs with neuroprotective action.

Purpose of the study. To analyze the therapeutic efficacy of cerebrolysin, depending on its dose, for motor and cognitive impairments in patients with ischemic stroke.

Materials and research methods. To assess cognitive functions, neuropsychological studies which were used that assess attention, memory, mental performance, and fluency.

For this, the MMSE test and special tests were used, such as the visual memory test, the Bourdon test, the speech activity test, and the clock drawing test. Control over the bioelectric activity of the brain in all patients was carried out using a 16-channel computer electroencephalograph.

The study was carried out in a multidisciplinary Bukhara regional hospital in the department of neurology for 6 months. All patients underwent a comprehensive clinical and instrumental examination. The main group consisted of 54 patients with ischemic stroke (IS) aged 45-70 years (mean age 61 years). Of these, 28 patients received Cerebrolysin, 30.0 ml per 150.0 ml of physiological solution, and 26 patients received Cerebrolysin, 10.0 ml intravenous stream for 2 weeks, but the dynamics of the disease was observed within 2 months. The control group consisted of 45 patients with IS, of the same age, who received standard therapy.

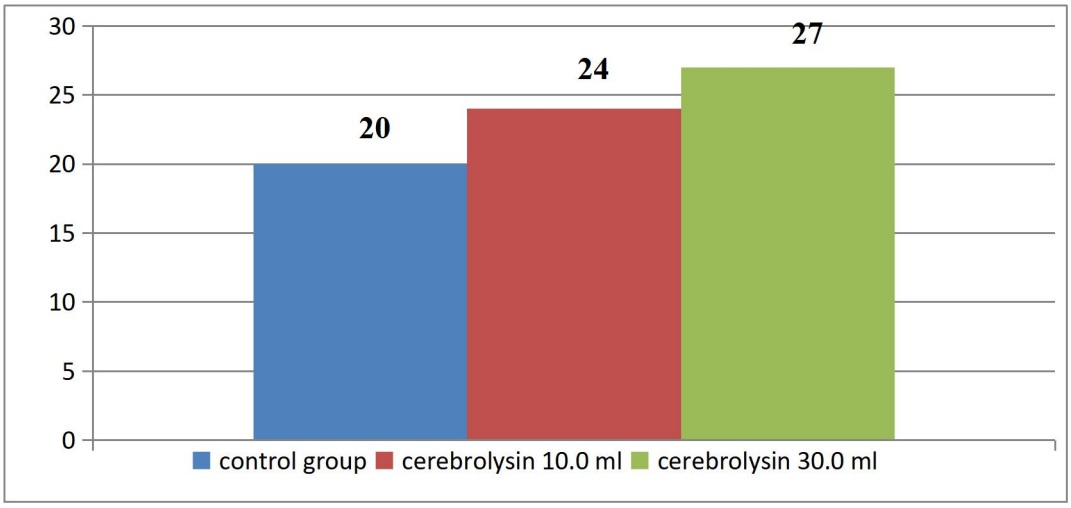
Results and discussions. Most often, patients in the main and control groups complained of headache, dizziness, memory loss, increased fatigue, irritability and emotional lability.

Most of the patients in the main group had cognitive impairments of varying severity, in 55% of patients ataxia, hypokinesia was observed in 23% of patients, not gross pyramidal disorders in 51%, pseudobulbar disorders were observed in 22% of patients.

Objective criteria for assessing the effect of cerebrolysin on cerebral cognitive functions were data from neuropsychological control studies, indicating an increase in the activity of mental processes in patients after treatment with Cerebrolysin. A mini-study of mental state according to the MMSE test, which makes it possible to judge such cognitive functions as perception, orientation, attention, counting, memory, speech, reading and writing, revealed an initially low level of preservation of cognitive functions before treatment. The average score, equal to 19 before treatment, increased to 27, approached the maximum (30 points) in the treatment with Cerebrolysin in doses of 30.0 ml. When treated with Cerebrolysin at a dose of 10.0 ml, the test results increased to 24 points. The indicators of the control group have an average score of 20 (Fig. 1).

Fig. 1

The results of the MMSE test of the subjects during two months depending on the dose of cerebrolysin compared with the control group.



All patients underwent electroencephalography (EEG). EEG was assessed at the time of inclusion in the study, i.e. before treatment, after the end of treatment with Cerebrolysin in doses of 10.0 ml and 30.0 ml after 2 months. The quantitative EEG data during treatment with Cerebrolysin were compared with the data of the control group receiving standard therapy.

Quantitative EEG analysis revealed significant long-term improvements in frequency and a significant decrease in the power ratio in patients with IS, and they were most pronounced after 2 months. The dynamics of EEG indicators during treatment was expressed in the form of reductions in slow-wave activity, consolidation and an increase in the alpha index, an increase in

the amplitude of the alpha rhythm, against the background of a decrease in diencephalic-stem disorders. In patients who received Cerebrolysin at doses of 30.0 ml intravenous drip in 150.0 ml of saline solution, an improvement in the bioelectrical activity of the brain was observed after 1 month of treatment and did not depend on the severity of the disease, rather than Cerebrolysin at doses of 10.0 ml i / v jet. With cerebrolysin in doses of 10.0 ml, an improvement in the bioelectrical activity of the brain was observed very slowly, after 2 months.

In patients before treatment in the general structure of the EEG, the intensity in the range of theta and delta rhythm in the main group was 30.6%, the alpha rhythm - 69.4%. After a course of treatment with Cerebrolysin at a dose of 10.0 ml, an intensity shift towards the alpha rhythm (74.4%) and a decrease in the intensity of slow rhythms (delta and theta, respectively 25.6%) were noted.

These changes were noted after 2 months. In the treatment with cerebrolysin in doses of 30.0 ml, a shift in intensity towards the alpha rhythm (83.6%) and a decrease in the intensity of slow rhythms (delta and theta, respectively 16.4%) were noted. These changes were noted after the 1st month. The shift in the structure of the intensity of the main EEG rhythms in the control group is not statistically significant (Table 1).

Table 1

Dynamics of bioelectric activity indices in patients treated with Cerebrolysin.

Indicators	**Periods**	**Main group**		**Control group**
		Cerebrolysin 10.0 ml	**Cerebrolysin 30.0 ml**	
Slow-wave activity index, %	Before treatment	30.6 %	30.6 %	30.6 %
	After treatment	25.6%	16.4%	28.2 %
Alpha-index, %	Before treatment	69.4%	69.4%	69.4%
	After treatment	74.4%	83.6%	71.8%

To determine the pronounced cognitive dysfunction, a speech activity test was investigated. Through this test, semantically and phonetically mediated associations were determined. In patients with IS, the number of phonetically mediated associations decreases faster than the number of semantically mediated associations.

So, before treatment, patients named 9 phonetically mediated associations and 10 semantically mediated associations, after treatment this number increased to 14 phonetically mediated associations and up to 20 semantically mediated associations. These changes were clearly visible in patients receiving Cerebrolysin in doses of 30.0 ml (Fig. 2,3).

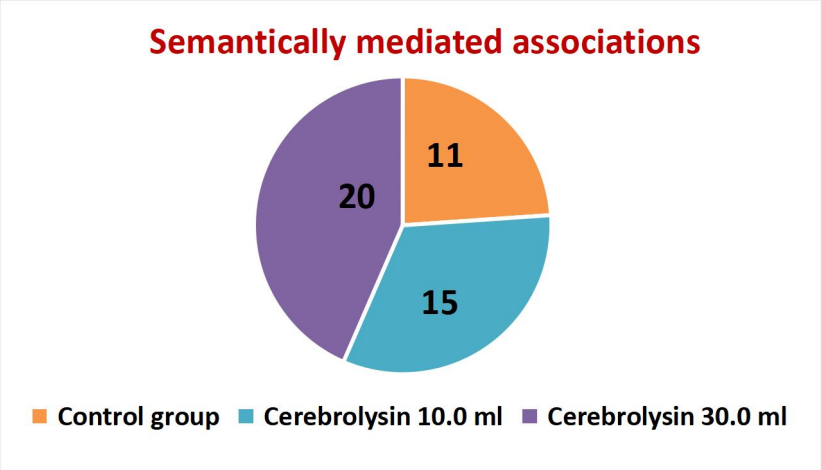


Fig. 2. Test results for speech activity after treatment

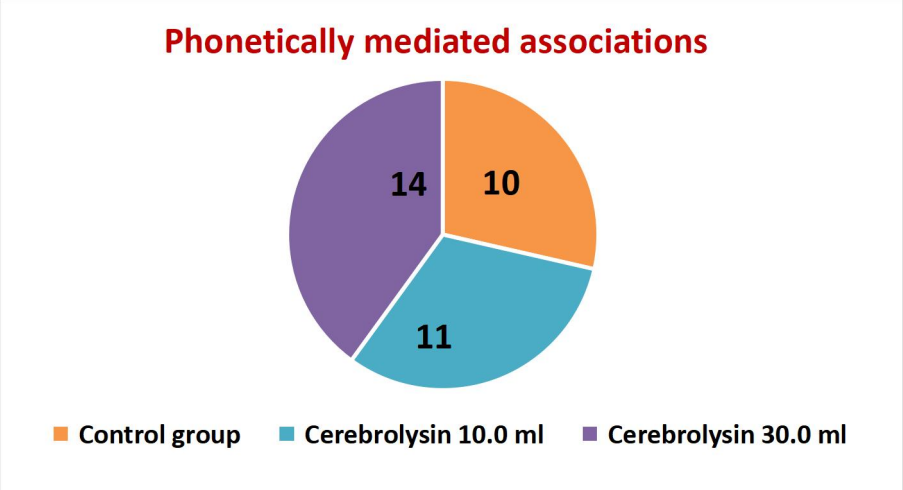


Fig. 3. Test results for speech activity after treatment

Conclusions

1. The use of cerebrolysin in patients with IS is pathogenetically justified and is expressed in the form of a dynamic effect in the shortest possible time of treatment. These changes are especially visible when using Cerebrolysin in doses of 30.0 ml
2. Cerebrolysin in doses of 30.0 ml has a positive effect on intellectual-mnestic disorders, reliably affects the dynamic indicators of the cognitive sphere (memory, perception, mental performance, etc.).
3. Indicators of bioelectrical activity of the brain according to EEG data against the background of therapy with cerebrolysin indicate a decrease in diffuse cerebral disorders.
4. Cerebrolysin in doses of 30.0 ml has a pronounced multimodal property, has a rapidly developing neuroprotective effect, which makes it possible to recommend its use for the therapeutic correction of both neuropsychological and motor disorders in patients with IS.

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