

## **Combined neuroprotection in recovery cognitive functions**

**Badashkeev Mikhail Valeryevich**

*Candidate of Pedagogical Sciences, Psychologist*

*Regional State Health Budget Institution Bokhansky district hospital*

**Shoboev Andrey Eduardovich**

*Neurologist*

*Regional State Health Budget Institution*

*Bokhansky district hospital*

**Abstract.** This paper examines the main features of combined neuroprotection in restorative treatment after ischemic stroke. In general, representing a pathogenetically sound direction at all stages of restorative treatment after cerebral circulation disorder. "Citicoline" is one of the most studied original domestic cytoprotectors, affecting the main pathophysiological processes of the ischemic cascade. The results of numerous clinical trials demonstrated the effectiveness, safety, wide range of pharmacological effects and good tolerability of "Citicoline" we conduct a combination combination with "Cortexin" in our study.

**Keywords:** neuroprotection, combined neuroprotection, multidisciplinary approach, ischemic stroke.

### **Introduction**

To date, the rather wide prevalence of ischemic stroke, the high percentage of disability and mortality of patients after cerebral circulation disorders lead to a high medical and social significance of the problem and the need to further study the pathogenetic mechanisms and find new approaches to the diagnosis and treatment of this disease.

In general, in our opinion, the effectiveness of restorative treatment of patients after ischemic stroke depends on the correct organization of the therapeutic process, the main principles of which are the fastest start of therapy aimed at restoring blood flow in the affected area of the brain and protecting it from hypoxia and ischemia. The patient should be hospitalized in a specialized hospital with the ability to provide resuscitation care and adequate treatment using a multidisciplinary approach, as well as providing a systematic consistent and continuous restorative process of cognitive functions.

### **Purpose of the study**

To determine the effectiveness of combined neuroprotection of "Citicoline" and "Cortexin" in the restoration of cognitive functions in patients who have undergone ischemic stroke in the recovery period.

### **Materials and methods**

Clinical comparative analysis was carried out in the groups of patients receiving Citicolin and Cortexin drugs in the rehabilitation period after ischemic stroke, which were comparable in terms of disease duration, age and sex. The clinical trial was conducted with the permission of the ethics committee. All patients gave voluntary informed consent for inclusion in the study. The study included patients with mild to moderate neurocognitive deficits who suffered ischemic stroke for more than 1 year. The average age ranged from 55 to 75 years (the average age was 64.5 years). The exception to the group was patients who had gross cognitive, motor impairment (hemiplegia) and speech impairment due to the consequences of brain infarction. To study the combined effect of the drugs (Citicolin and Cortexin), patients were selected who underwent a diagnostic study from a medical psychologist, neurologist. All patients were informed in detail about the safety of the clinical trial. In accordance with all criteria, 112 patients admitted to the Bochanskaya RB OGBUZ in the period 2019-2020 were treated and examined. All patients were divided into 3 groups. Group 1 - 38 patients treated with Cortexin 20 mg w/m in combination with baseline therapy. The 2nd group was 37 patients treated with Citicolin 2000 mg in combination with basic therapy. The 3rd group was 37 patients who underwent combined neuroprotection with Citicoline drugs at a dose of 2000 mg per cap per day and Cortexin 20 mg per meter [1].

### **Results and discussion**

In the analysis of the results of our clinical study of combined neuroprotection with the drugs "Cortexin" 20 mg in/m and "Citicoline" at a dose of 2000 mg in/per cap per day, we determined that after 10 days of restorative treatment, there is a positive dynamics of short-term memory, long-term memory, auditory memory, more efficiently perform logical-mathematical and arithmetic tasks, at the end of the course of restorative treatment of patients. Our control study of already discharged patients who underwent restorative treatment in our department after 30 and 50 days also confirmed the positive dynamics of cognitive recovery, as well as socio-adaptive mechanisms [2, 3].

Thus, the results of the combined use of complex neuroprotection "Citicolin" and "Cortexin" significantly increase the effectiveness of restorative treatment and the positive dynamics of cognitive recovery, which is explained in principle by complementary mechanisms

in the energy cell regulation of brain neurons. Also, taking into account the diverse polypeptide and amino acid composition of the Cortexin drug, the metabolotropic effect on the central nervous system was primarily noted: increased glucose transport to brain cells, activation and relaxation of glycolysis, "inclusion" in the cycles of amino acids: proline, leucine. The content of inhibitory amino acids (glycine, taurine, GABA, serine) in the preparation counteracts mediator imbalance, which supports trophotropic neurotransmission. Previously, neurotrophic treatment of polypeptides in combination with the neuromediator substance cyticoline contributes to the improvement of cognitive functions.

Citicoline is a direct stimulator of the cholinergic system; plays the role of neuropoietin for central neurons, also has metabolotropic effects on the Corey cycle and the Kennedy shunt. In conditions of reperfusion attacks on brain cells, cyticoline protects against excessive catecholamine effects [4, 5].

### **Conclusion**

Thus, the study is relevant and proves the effectiveness of combined neuroprotection by Cyticolin and Cortexin in comparison with Cortexin and Cyticolin monotherapy in restorative treatment, as well as post-stroke cognitive disorders. This combination positively affects mental performance, patients more quickly performed logic-arithmetic tasks, which generally positively affects neurological status, without causing any side effects.

Thus, the results obtained by us in the course of clinical research can be recommended for the restorative treatment of patients who have undergone ischemic stroke, and also this combination of drugs can be recommended for use in all forms of ischemic cerebrovascular diseases.

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