Introduction. In our clinic we have developed a new protocol of using surplus pressure in a pressure chamber for the treatment of consequences of cerebral stroke and neurodegenerative diseases. Contrary to hyperbaric oxygenation (HBO), the method was called normoxic curative compression because it did not lead to blood plasma hyperoxygenation. Normoxic compression in a pressure chamber is accompanied by activation of tissue respiration, sustained recovery of microcirculation, and normalization of the redox status of the brain. Combination of normoxic compression with a reversible immunosuppressant (cyclosporine A) significantly increases the curative effect of the method in neurodegenerations, including ALS, and causes a decrease in apoptosis. ALS patients with immunodeficiency often have high titer of antibodies to neuroinfectious agents, in particular toxoplasmosis.

We have studied an effect of the treatment of toxoplasmosis on the results of combined use of cyclosporine A and normoxic compression.

Characteristics of the main groups of ALS patients

<table>
<thead>
<tr>
<th>Segments</th>
<th>Age (Years)</th>
<th>Duration of disease (months)</th>
<th>Bulbar symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALS without toxoplasmosis</td>
<td>43</td>
<td>54,04,5,5</td>
<td>182</td>
</tr>
<tr>
<td>ALS with toxoplasmosis</td>
<td>32</td>
<td>53,13,2,9</td>
<td>173</td>
</tr>
</tbody>
</table>

Results. In the treatment of bulbar ALS with marked phonation and swallowing disorders, the use of normoxic curative compression in a pressure chamber in combination with cyclosporine A was accompanied by restoration of phonation and swallowing functions to various degrees and by increasing respiratory volumes, which allows one to delay the beginning of nutritural and tracheotomy for a time. Fig. 1 shows the dynamics of respiratory volumes in 2 groups of ALS patients who were administered and not administered Fansidar. The increase in respiratory volumes was more apparent in the group of patients received Fansidar (third group). In Fig. 2 shows dynamics of the immune status parameters in patients without toxoplasmosis (n=25), in patients with toxoplasmosis who did not receive Fansidar (n=9), and patients with toxoplasmosis who received Fansidar (n=20). After the treatment with cyclosporine A in combination with normoxic compression, the patients of the first and the third groups demonstrated a significant decrease in CD95 and a tendency to normal generalization of the immune status. The second group of patients (n=3) with high toxoplasmosis-specific IgG titers who did not receive Fansidar demonstrated inverse dynamics in the form of a significant increase in CD95.

In Fig. 3 shows. lifetime of the process after the treatment (more than 3 years) was observed in 5 patients with doubtful initial diagnosis of ALS. The use of cyclosporine A in combination with normoxic compression was accompanied by marked improvement in bulbar symptoms, disappearance of fibrillations and even an increase in strength and muscle mass along with a significant decrease in CD95. After the treatment, 3 patients with high titers of toxoplasmosis-specific antibodies who did not receive Fansidar had a significant increase in CD95 with a minimal curative effect. Then, all patients with toxoplasmosis received a long-term treatment with Fansidar according to the recommended schemes. The analysis of the clinical effect and the aftereffect duration showed that the group of patients with toxoplasmosis who received Fansidar demonstrated more pronounced increase in respiratory volumes and longer lasting curative effect.

Discussion. The use of cyclosporine A in combination with normoxic compression in a pressure chamber causes as a rule a decrease in apoptosis (CD95) and an improvement of tissue respiration, accompanied by the curative effect in ALS. If an ALS patient has persistent toxoplasmosis, addition of Fansidar to the treatment complex significantly increases the curative effect of the method and the aftereffect duration. The analysis of the clinical effect and the aftereffect duration has shown that one can observe more expressed improvement of the respiratory function and longer lasting curative effect in the group of toxoplasmosis patients receiving Fansidar.

It can be assumed that, in full-blown ASL against a background of immunodeficiency, the presence of high titers of toxoplasmosis-specific antibodies may serve as an indication of toxoplasma dissemination in patient’s organism. An expressed improvement of the respiratory function in the treatment of toxoplasmosis can demonstrate a direct effect of toxoplasmosis on lungs. The obtained data can support the primarily inflammatory nature of motor neuron disorder in ALS, which, in the presence of an inherited or acquired mitochondrial dysfunction in a certain stage of the disease, develops into persistent autoimmune inflammation with activation of apoptosis. The curative compression restores mitochondrial respiration and improves microcirculation, providing an increased effect of cyclosporine A and a decreased apoptosis, which is observed in regions of separate neurological symptoms in ALS, in general, bulbar symptoms.

Materials and methods. Seventy patients with ALS were observed. Thirty five patients exhibiting high IgG titers to toxoplasmosis. All patients received Cyclosporine A (0.2-3 mg/kg) and compression air at 1.1 ATA in chamber (12 and more session up to 20 minutes). Thirty two patients with toxoplasmosis were administered Fansidar (3 group). The second group consisted of patients suffered from toxoplasmosis who were not administered Fansidar.

The first group composed 43 ALS patients without toxoplasmosis. The table shows the characteristics of the main groups of ALS patients categorized in accordance with their age, duration and severity of the disease. Complex investigations included: the score estimations of ALS, the immunological status, a monitoring of external respiration, and acid-base state.

Dynamic of CD95 in ALS patients after NLC with Cyclosporine A with or without Fansidar (F)

Dynamics of CD95 in ALS patients after NLC with Cyclosporine A with or without Fansidar (F)

Life time of patients with severe ALS after NLC and Cyclosporine A

With a high titers to toxoplasmosis with Fansidar

![Photo of February 27, 2012: 32-year-old female patient (57) after an NLC session (the third treatment course). Diagnosis: mixed form of ALS with swallowing and phonation disorders and pronounced decrease in respiratory volumes (severe reduction of FVC and MVV). The patient with 4 stage of ALS is observed for 8 months from 10 June, 2012; the diagnosis was made a year before the treatment.](https://example.com/image)

![Dynamic of CD95 in ALS patients after NLC with Cyclosporine A with or without Fansidar (F)](https://example.com/image)

![Life time of patients with severe ALS after NLC and Cyclosporine A](https://example.com/image)

![With a high titers to toxoplasmosis with Fansidar](https://example.com/image)

Conclusion.

1. The treatment of ALS patients with persistent neuroinfection can improve the efficiency of the therapy directed to slowing down the progression of ALS.

2. The method of normoxic curative compression in combination with cyclosporine A is completely safe and does not have side effects even in severe ALS patients. Significant decrease in apoptosis and stabilization of ALS patient's condition are observed during the course of specific anti-inflammatory and antiviral therapy.

3. The curative effect of the method is more apparent in the early stages of the disease.

Reference.


