increasing of TNF, its level being correlated with the course of disease.

Summarizing the above data it can be concluded that the brain realizes immune functions by means of three morphologically and functionally different subsystems: the first one is represented by lymphoid cells of CSF (T-, B-cells and their subpopulations), natural killer cells, monocytes and macrophages; the second one is represented by non-lymphoid cells of nerve tissue - microglial cells, astrocytes, oligodendrocytes and cells of vascular endothelium; the third subsystem is represented by humoral factors, biological active substances - mediators, peptides, cytokines and others. Thus, analysis and generalization of literature and our clinical-experimental data change our notions about the role of brain in immune response. The presence in the brain of high-effective set of lymphoid and non-lymphoid cellular elements and their products allows to consider that, besides the realization of very complicated psychical functions, the brain not only takes part in generation and regulation of immune response in CNS and general immune system, but also itself is one of the organs of immune system.

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ROLE OF IMMUNE DAMAGES IN THE NEUROLOGIC PATHOLOGY

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Cerebrovascular pathology still has an enormous impact on public health of every nation. It is ranking among the leading causes of serious disability. One of the most unfavorable forms of disability that has the greatest social value is dementia. Epidemiological studies have identified 46 persons with vascular dementia (7,3%) and 14 persons with probable Alzheimer's disease (1,2%), mean age 50,4±6,7 years. Identification of the main causes contributing to the development of dementia and elaboration of early preventive measures is the issue of great importance. Studies conducted give us an opportunity to define and analyze the factors influence on the development and outcome of cerebrovascular dementia and probable Alzheimer's disease. We believe that these researches will have increasing importance.

Recently object of research HLA of system were HLA antigens. HLA antigens were investigated in various human populations. After establishing the method of polymerase chain reaction, opportunities emerged to explore the different sections of DNA and the genes that are located in these sections. Molecular-genetic methods of research extremely enlarged our knowledge of alleles, especially those of class III and its polymorphism. The last hypothesis about HLA structure has been reviewed (6). Genes of class III in comparison to genes of classes I and II are not fully researched. Genes of class III are located in the space between genes of classes I and II of HLA system and have important biological functions (7). Investigation of polymorphism of genes of class III (HLA) system is of great importance for the problem of HLA and cerebrovascular pathology, as well as for problems of neurological and immunological memory and perspectives of rehabilitation of such patients (4). Recent investigation revealed a large number of new genes belonging to the class III (HLA) system.

Our aim was to determine the concentration of cytokines TNF-α, TNF-β encoded by genes A and B of the locus of TNF in blood serum and cerebrovascular fluid of patients

with cerebrovascular dementia and probable Alzheimer's disease, also in patients with cerebrovascular pathology without dementia. Recent investigation show that cytokines TNF-α and TNF-β synthesized by genes of TNF locus actively participate in the formation of severe pathological processes in the human organism. TNF-α is synthesized by various cells, while TNF-β is produced by lymphocytes only.

Fifty-two patients aged 40-67 years were investigated. 14 patients were with probable Alzheimer's disease, 28 patients had vascular dementia. 10 patients had vascular pathology without dementia. These 10 patients composed a control group. The rate of dementia was defined by application of MMSE. The diagnosis of probable Alzheimer's disease was made by exclusion, in accordance with NINDS-ADRDA criteria.

A blood sample was taken from elbow venue. Lumbar punctures were performed in the L4/L5 interspace. Serum levels of TNF-α and TNF-β were measure by a competitive enzyme-linked immunosorbent assay (ELISA). The working range of ELISA assay was 0,60-2,50 ng/ml. It is shown, that the levels of TNF-α and TNF-β in serum and CSF in the control group in patients with probable Alzheimer's disease do not differ significantly. In patients with vascular dementia, the levels of TNF-α and TNF-β are increased as compared to the control group and the group with probable Alzheimer's disease ($p<0,0001$; $p<0,05$). The result show that in cases of vascular dementia the serum and CSF levels of TNF-α and TNF-β are increased. Elevations of these levels indicate that cytokines, in particular, TNF-α and TNF-β, play an important role in the development of vascular dementia. It might be linked to the toxic impact of TNF-α and TNF-β in the brain tissue.

As it is know for recent investigation, cytokines TNF-α and TNF-β, synthesized by genes A and B, have a great influence on inflammation processes. Cytolytic and cytotoxic effects mediated by them against the neurons of subcortical structures and endothelial cells of microvessels emphasize important biological functions of genes A and B of TNF locus and cytokines synthesized by them.

The possibility of several pathological disorders in human caused by impairment in the in the structure of genes, which are localized next to genes of classes I and II of HLA complex, or by functional activity of albumen products encoded by them, was well known in neuroscience (1,2).

The result obtained show biological importance of genes of TNF locus class III HLA system and by them encoded TNF-α and TNF-β in the pathogenesis of vascular dementia. It is possible that albumen products of genes TNF participate in the intracellular processing of antigens. According to our result, cytokines TNF-α, TNF-β and genes A and B of class III of HLA system are not involved in the pathogenesis of Alzheimer's disease.

Literature about peripheral nervous disorders show the examples when neither axon structural abnormalities nor demyelination occur. The major change in these disorders is in ion channels of peripheral nerves. This is analogous to the ion channelopathies establishes in the etiology of hereditary muscle diseases. Ion channels may be infected by toxins, antibodies, metabolic factors. Partial blocking of Na^+ channels results in slowing of nerve conduction velocity without conduction block, decreased nerve action potential amplitude in the absence of histologic demyelination. Antibodies directed at Na^+ channels in demyelinating diseases are receiving increasing attention.

According to these data, we aimed to investigate the role of the pathology of Na^+ and K^+ channels in the pathogenesis of neuropathies and polyneuropathies and elaborate a new approach to the treatment of these pathologies.

Epidemiological research has been executed to show expansion of neuropathies and polyneuropathies. 262 patients were investigated, among them 175 men and 87 women aged from 14 to 78 years. In 38 patients, polyneuropathy was identified. 27 patients showed Guillian-Barre syndrome of chronically allergic origin and in 12 patients diabetic polyneuropathy was identified. In patients who suffered from Guillian-Barre syndrome conduction of action potentials in the nerves was reduced. Electromyography research showed slower nerve conduction and decreased nerve action potential amplitude was noted along with axonopathies. We consider that it reflects the blockade of voltage Na^+ channels by antibodies.

As it is well known, the chemical structure of neurons membrane and the structure of their axons are different. Neuron membrane consists of lipids, proteins and polysaccharides (3,5) that are in the close interrelation with water. Water

around the neurons include ions and metabolic factors. The electrical activity of the membrane depends on intracellular concentration of Na^+ and K^+ that is balanced by Na^+ channels and by conduction of stimulus at some nodes.

Clinical and electrophysiological data obtained allow us to suppose that in mononeuropathies and polyneuropathies, function of Na^+ and K^+ channels are impaired and may play a leading role in the pathogenesis of polyneuropathies. Apparently, the pathology of ion channels plays an important role in the pathogenesis of axonopathy. Pathophysiologic abnormalities of ion channels cause an atonal degeneration with demyelination, distal axonopathy and impairment of the function of peripheral nerves. There is now extensive evidence for peripheral nerve dysfunction. Abnormalities of peripheral nerve Na^+ and K^+ channels result in a diversity of clinical and electrophysiological phenomena.

At patients with diabetic polyneuropathies, the sensory fibers were mostly affected. The role of antibodies directed at Na^+ channel blockade may play an important role in conduction slowing and blocking occurs. Antibodies can suppress voltage-sensitive Na^+ currents, block Na^+ channels and disrupt the membrane (3).

In 20 patients with Guillian-Barre syndrome we apply an immunomodulator Plaferon-LB, along with leucoplasmapheresis. Plaferon was given at a dose of 0,05-1,0 mg protein/kg for 15 days. 17 patients were treated traditionally with leucoplasmapheresis. It this group, 5 patients (29%) recovered fully. Improvement could be detected in 9 (52%), while in the group treated with Plaferon-LB and leucoplasmapheresis 7 (70%) showed full recovery. According to the result obtained, we consider that pathology of ion channels may play an important role in the pathogenesis of demyelination diseases. Application of immunomodulation may reduce the level of antibodies that block the Na^+ channels. Immunomodulator Plaferon-LB suppressed the autoimmune processes and autoaggression thus promoting to restoration of the function of ion channels.

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