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The Role And Importance Of Gliah Neurotrophical Factors In Early Diagnosis Of Parkinson Disease

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Abstract: The role and importance of glial neurotrophic factor in the early detection of Parkinson's disease has been assessed. Depending on the clinical forms and duration of the disease, the amount of glial neurotrophic factor in the blood serum of patients was analyzed.

Key words: Parkinson's disease, GDNF, neuron, degeneration

Parkinson's disease (PC), along with other neurodegenerative diseases of the nervous system, is one of the most pressing socio-economic problems today and is one of the main causes of disability. The fact that the disease is more common in able-bodied people indicates that this problem is even more acute [1,2,10].

PC is one of the most pressing issues not only in Uzbekistan, but also in other countries around the world. One of the main reasons why this disease is a chronic problem is that its etiopathogenesis has not yet been fully studied. Due to the fact that the disease is hereditary neurodegenerative, the effectiveness of treatment is low, and patients with the disease need lifelong treatment. Although the disease is mainly manifested by movement disorders, the study of non-motor disorders of the disease as a predictor also requires scientific research with a deep pathogenetic basis [3-9].

After the degeneration of dopaminergic neurons in the PC, the main movement disorders of the disease, of course, do not pose any difficulties for diagnosis. However, identification of early-stage predictors, their complete biochemical substantiation, prevention of degeneration of dopaminergic neurons, early differential treatment measures, and early detection and early detection of the disease are important.

One of the least studied areas in neurology is neuroglia and glioneuronal interaction. Many recent studies, including the neurological state of the nervous system, are being studied mainly in the neural sphere, while the changes at the glial level are lagging behind. One of the factors associated with changes at the gilal level is neurotrophic factors.

Neurotrophic factors (NF) are polypeptide compounds that are synthesized by neurons and glial cells and are involved in regulating the growth process. Neurotrophs are proteins that maintain the sequence of high-molecular amino acids and have the property of forming homodimers. These polypeptides regulate the survival, function and development of neurons. (Gomazkov, 2011; Thal, 1996; Schinder, Poo, 2000; Huang, Reichardt, 2001; Volosin., 2006; Mocchetti, Brown, 2008; Conner., 2009).

Currently, neurotrophic factors are divided into the following families:

1) Neurotrophins, or nerve growth factors (NGF, BDNF, NF-3, NF-4/5);
2) .Glial factors (GDNF, NTR, ART, PSP);
3) .Ciliary factors (CNTF, LIF, I L-6);
4). Other neurotrophic factors (endothelial growth factor).

The first representative of these proteins was the nerve growth factor (NGF), which was identified in 1951 [14,15,16].

Brain Derived Neuro trophic Factor (BDNF) was later identified. This factor is found in the growth of neurons, axons and dendrites, the formation of synapses and other neuroplastic processes, not only in ontogeny, but also in the brain cells of older organisms. Molecular weight 27.2kDa. Sensors are

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involved in the development and maintenance of cholinergic neurons in the midbrain and hippocampal neurons [19,22].

Another endogenous neurotrophic factor is glial neurotrophic factor (GDNF). Cells of the central and peripheral nervous system are involved in the processes of differential differentiation and proliferation. GDNF) was detected in 1993 in the midbrain gall cells of rats, and later in spinal cord motoneurons. This factor also has effects outside the nervous system, for example, in the process of renal skeleton and spermatogenesis. The mature molecule consists of 134 amino acids and has a molecular weight of 34 kDa. The maturation of the protein is associated with glycosylation and the formation of homodimers at the expense of disulfide bonds. Isoforms of this protein have been identified in the human brain, one of which is specific to Alzheimer's disease [29,30].

The GDNF family consists of 4 members: glial neurotrophic factor, neuroturin, artemin, and persefin. All of these are involved in supporting the migration, differentiation, proliferation, and survival processes of neuron populations [15]. GDNF activity consists of membrane-bound receptors consisting of 2 units, the first of which is associated with a ligand-binding component (GFR α) and the second with tyrosine-kinase activity (Rearranged during Transfection) [17-19].

The GDNF factor regulates cellular activity by increasing intracellular Ca ++ concentrations and interacting with glycosyl-phosphatidylinizitol. It binds to GFRα and then transmits the impulse to the Ret receptors through the transmembrane and regulates the growth and viability of neurons [21,34].

One study showed that GDNF secretion and RET / GFRα1 receptor activation may lead to glioma invasion in brain tissue [24,29]. Hyperexpression of glial neurotrophic factor is the most important factor in the pathogenesis of this tumor [31,]. The GDNF factor is produced by the cells of the anterior pituitary gland, including 95% of somatotrophic cells, and plays a key role in the pathogenesis of pituitary adenomas [24]. A number of neurodegenerative diseases, including Alzheimer's disease, are characterized by a decrease in the synthesis of neurotrophic factors. (Hock et al., 2000; Schaub et al., 2002; Bruno et al., 2009; Allard et al., 2012).

Thus, based on the analysis of a large number of scientific literature, the role and importance of glial neurotrophic factor in the development of PC in relation to the stages of the disease, that is, in the period of early detection of motor disorders, is not known. We have not seen the results of scientific studies on the prognostic value of early detection of the disease. The study of the above-mentioned changes, which are not observed in the literature review, requires the study of glial neurotrophic factor in PC as a predictor and the need to conduct research in this area in order to properly assess its prognostic significance.

Materials And Methods

To study the role and importance of glial neurotrophic factor in the early diagnosis of Parkinson's disease

A total of 88 patients were screened to assess the role and importance of glial neurotrophic factor in the early detection of Parkinson's disease. 78 patients with PC disease and 10 patients who did not have PC disease in the control group. Of the patients examined in the main group, 39 (50%) were men and 39 (50%) were women. Accordingly, the control group consisted of 5 men (50%) men and 5 women (50%). The average age of male patients with PC was 18-70 years, with an average age of 52.6 ± 11.1 years, and the average age of women was 32-68 years, with an average age of 59.7 ± 10.9 years. The duration of the disease was 4.1 ± 5.6 years in men and 6.32 ± 5.8 years in women.

Given the forms of Parkinson's disease, only patients with primary idiopathic PC were included in the study. For this, the diagnosis of PC was based on the criteria of both A. Hughes and co-authors, and the British Brain Bank (Hughes A. J. et. Al. 1992). Based on a number of criteria, PC was differentiated from secondary vascular parkinsonism and other types, as well as tertiary parkinsonism, ie parkinsonism associated with other neurodegenerative and hereditary diseases. Diagnosis of PC was made on the basis of patient complaints, medical history, genealogical history, signs of nervous system damage, clinical-laboratory and neurovisual (CT, MCT and MRI).

Patients with PC were classified according to clinical forms of the disease, of which 25 (32.05%), patients with akinectic-rigid form, 17 people (21.7%), patients with tremor were diagnosed with 18 (23.1%). %) and patients with a mixed form of the disease, 18 patients (23.1%) were the first to start, ie patients with

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little to no signs of PC. Patients in all groups were taken in approximately the same amount, depending on age and sex.

In our study, the amount of glial neurotrophic factor in blood serum was tested by enzyme-linked immunosorbent assay (ELISA).

The obtained results were statistically analyzed using a special software package Microsoft Office Excel-2007 on a computer Pentium-IV, using the method of variance statistics for medical and biological tests.

Discussions And Results

The results showed that the average serum glial neurotrophic factor in 78 patients with PC was 34,655 pg / ml, while in patients without PC in the control group, the figure was 73,558 pg / ml. The decrease in glial neurotrophic factor was found to be more than 2 times ($p < 0.05$). The results obtained can be explained by the fact that the main function of the glial neurotrophic factor is to respond to the trophism of dopaminergic neurons, the lower this factor, the greater the degeneration of dopaminergic neurons. Therefore, the factor that triggers the trophism of dopaminergic neurons is the glial neurotrophic factor. Denegeneration of dopaminergic neurons is also directly related to this neuroleptic neurotrophic factor, which has an incorrect correlation with each other, one decreases the other, and the other decreases the first.

That is why we have chosen the same neurotrophic factors to study the degeneration of neurons.

In the next phase of the study, we found it necessary to perform a comparative analysis of serum GDNF in patients with various clinical forms of PC. The results show that the amount of GDNF in the akinetic rigid form is 35.5 ± 4.8 pg / ml, in the vibratory form of the disease - 31.5 ± 5.7 pg / ml, and in the vibratory form of the disease - 30.21 ± 4.8 pg / ml. , in the mixed form of the disease was 28.2 ± 4.8 pg / ml, while in the early stages of the disease in 25 patients this figure was 38.2 ± 6.7 pg / ml.

As can be seen from Figure 1, the amount of gilal neurotrophic factor in the blood serum of patients is organically related to the clinical forms of the disease. We know that the akinetic-rigid form of the disease begins earlier, and in a short period of time it can develop into a vibrating form, and a vibrating form of a mixed form. From these data, it can be concluded that the incidence of glial neurotrophic factor in the serum of patients with PC is lower than in the control group. A decrease in this factor in the early stages of the disease indicates the onset of degeneration of dopaminergic neurons. Akinectic - begins to decrease along the series of rigid, titro and mixed forms.

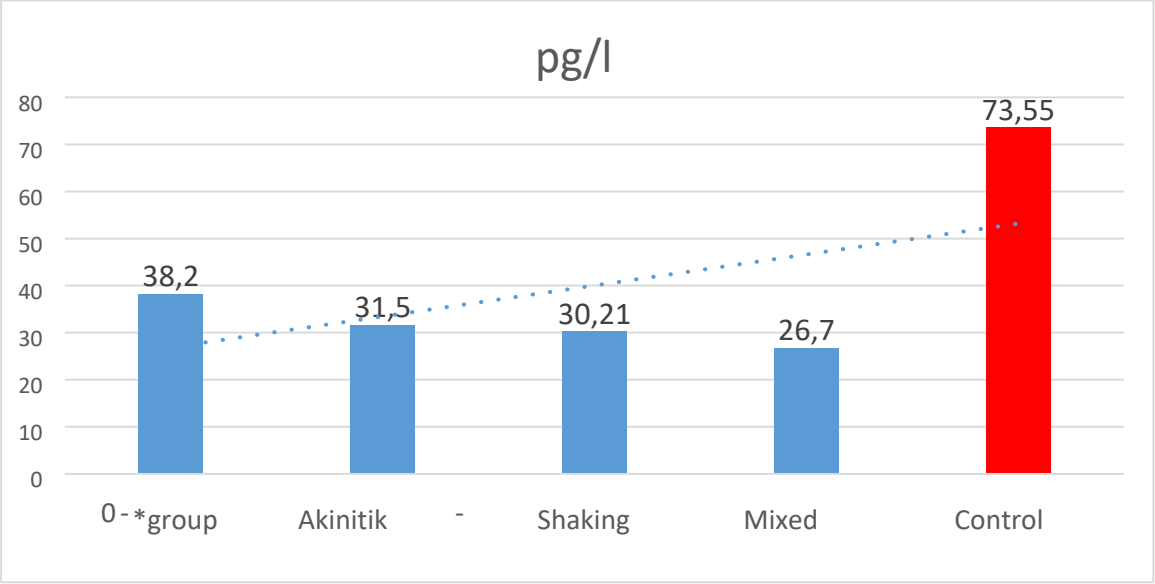

Figure 1. Analysis of serum GDNF in patients with PC by clinical forms of the disease

The results obtained can be explained by the fact that the glial neurotrophic factor is specific to the gala astrocytic glia and is the main factor that nourishes the dopminergic neurons. Therefore, depending on the changes in the serum of this protein, it is possible to think about the process of degeneration of dopaminergic neurons.

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In the next step, we analyzed the patients according to the year in which they were actually treated. The results show that in all patients with a total disease duration of 5.56 ± 6.2 years, the serum glial factor was 25.12 pg / ml, while in patients with an average disease duration of 6.8 ± 5.2 years it was 45.35. pg / ml, in patients with an average duration of 4.6 ± 3.7, 32.6 pg / ml, and in patients with an average duration of 2.3 ± 4.6, this figure was 45.35 pg / ml, 2- figure.

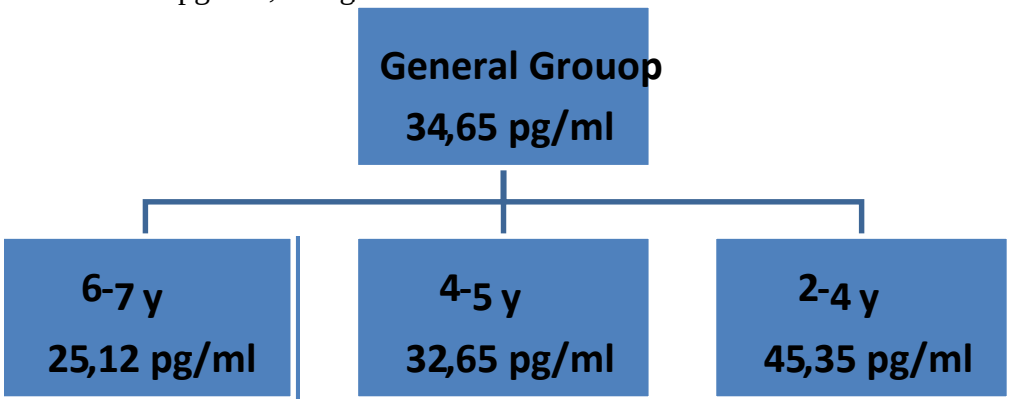

Figure 2. Changes in the amount of gallbladder neurotrophic factor in the blood serum of patients according to the duration of the disease

The results of the above study show a decrease in serum glial neurotrophic factor in patients with increased disease duration. This is the reason why the studied factor can be considered as a projector for PC.

Conclusion

1. Patients with Parkinson's disease have a relatively high level of glial neurotrophic factor in the serum in the early stages of the disease, and the incidence of the disease decreases.

2. In patients with Parkinson's disease, the amount of gilal neurotrophic factor in the blood serum is organically related to the clinical forms of the disease and begins to decrease with a number of akinectic-rigid, tremor and mixed forms.

3. A decrease in this factor from the early stages of the disease indicates the onset of degeneration of dopaminergic neurons, and early detection can be considered as a biochemical predictor.

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