

RELATIONSHIP OF CLINICAL COURSE AND BIOMARKERS OF ISCHEMIC STROKE RISK IN PERSONS OF YOUNG AGE

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ABSTRACT:

In recent years, the problem of stroke in the young, in particular, issues study the biomarker of risk of ischemic stroke, given a lot of attention due to its insufficient knowledge and a steady increase in the number of cases among people of working age. The purpose and research was to determine the values of homocysteine and BDNF as a biomarker's risk of ischemic stroke in young adults. A total of 123 patients with ischemic stroke in the acute period were examined. The control group consisted of 54 young people without cerebrovascular pathology. The research results showed, the levels of homocysteine and BDNF has age characteristics and has a correlation relationship with the severity of neurological deficit. The data obtained will make it possible to develop an algorithm for a differentiated approach to the prevention of cerebrovascular pathology and to reduce the risk of ischemic stroke in young people.

Keywords: Young age, ischemic stroke, TOAST classification, NIHSS scale, homocysteine, BDNF.

INTRODUCTION:

Today, one of the most pressing problems of modern medicine is a steady increase in the incidence of stroke and a high

mortality rate among young people [1,2], while it is not always possible to determine the cause of ischemic brain damage [3,4,5]. The question of the study of risk factors for the development of ischemic stroke (IS) in this category of patients remains open, which plays an important role in the development of a set of measures aimed at preventing cardiovascular and cerebrovascular pathology, as well as reducing the risk of recurrent strokes [4,5]. A number of scientists associate the development of stroke and the severity of neurological deficits with the influence of biological markers, in particular homocysteine and BDNF, with the help of which we obtain the necessary information about the key bioprocesses occurring during cerebral ischemia [6,7]. As we know, homocysteine is a sulfur-containing amino acid that is a metabolic product of cystine and methionine. With a lack of vitamins B12, B6 and folic acid in the body, an increase in the concentration of homocysteine in the blood is observed. In turn, hyperhomocysteinemia leads to endothelial dysfunction, impaired rheological properties to the ditch, venous thrombosis, etc. [7.8]. B the concerns of BDNF, it is considered a key mediator of neuronal survival and recovery [9]. A decrease in its concentration is associated with the development of neurodegenerative diseases, and can also lead to ischemic brain damage [9,10].

THE PURPOSE OF RESEARCH:

To determine the clinical significance of homocysteine and BDNF as a biomarkers risk of ischemic stroke in young adults.

MATERIALS AND RESEARCH METHODS:

We examined 123 patients in the acute period of ischemic stroke who were admitted urgently to the emergency neurology department of the Samarkand branch of the RSCEMP. All patients were divided into two groups depending on the age category: the main group consisted of 73 patients aged 20 - 45 years (mean age 39.2 years), of which 47 (64.4%) were men and 26 (35.6 %) women, the comparison group - 50 patients over 60 years old (average age 65.1 years; men - 37 (74 %), women - 13 (26 %)).

The diagnosis was verified based on the data of the clinical and neurological examination and the results of the MSCT study, taking into account the TOAST classification criteria. The severity of the patient's condition was assessed using the NIHSS scale. The control group included 54 young people (average age 30.6 years), of which 31 men (57.4 %), 23 women (42.6 %) without cerebrovascular pathology. Determination of the level of biomarkers in blood serum was carried out by ELISA on an Immulite 2000XPi apparatus (Siemens Healthcare Diagnostics Inc., USA). The BDNF concentration was determined by the sandwich method. In this case, for the reference takes the value recommended by the manufacturer. Statistical data were processed using the Microsoft Office Excel (2016) and Statistika software package using the Student's test and the Mann-Whitney test.

RESEARCH RESULTS:

When conducting complex clinical and neurological examination and distribution of patients depending on the subtype of AI, according to the criteria of classification TOAST, the main group atherothrombotic under type (ATI) met in 21 (28%) patients, cardioembolic type (KEI) - in 8 (10.96%), lacunar stroke (LI) - in 12 (16.44%) and idiopathic stroke (IPI) - in 32 (43.83%) patients. In the comparison group, ATI was diagnosed in 27 (54%) cases, CEI - in 10 (20%), LI - in 8 (16%), IPI - in 5 (10%) patients (Fig. 1).

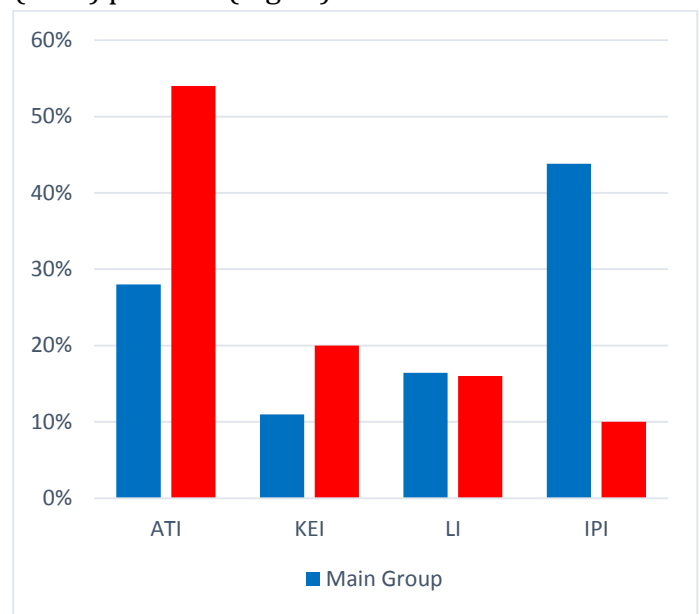


Fig. 1 . Distribution of patients according to TOAST criteria

It was also found that in 20 (27.4%) patients of the main group and 18 (36%) patients in the comparison group, the ischemic focus was located in the left carotid basin, in 31 (42.47%) and 19 (38%) patients, respectively - in the right carotid basin, in 15 (20.54%) and 11 (22%) - in the vertebrobasilar basin, in 7 (9.59%) and 2 (4%) patients, a combined lesion of two basins was revealed (Fig. 2).

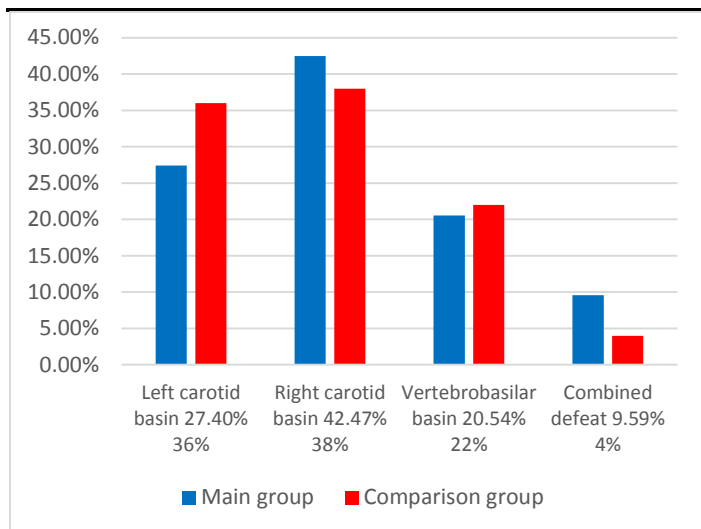


Fig. 2 . Distribution of patients depending on the localization of the pathological focus

Further, to assess the severity of the clinical course and determine the severity of neurological deficits, we used the National Institutes of Health Stroke Severity Scale. Data interpretation was performed according to Brott et. al., according to which a satisfactory condition was considered with a total of 0 points, a mild condition - 3 - 8 p, - a moderate condition 9 - 12 p, a severe condition -13 - 15 p, an extremely severe condition 16 - 34 p, coma - over 34 points. At the same time, a total of less than 10 points indicates a favorable outcome, and more than 20 points indicates an unfavorable outcome. At the same time, the average indicator of mild degree in the main group was 4 ± 0.30 (6.8%), moderate severity - 10.4 ± 0.11 in 56.1% of patients in the main group and 11.5 ± 0.27 in 48% of patients in the comparison group, severe - 14.1 ± 0.95 in 37% of the main group and 14.8 ± 0.87 , in 52% of the comparison group (Table 1).

Table 1. Assessment of the severity of patients' condition according to the NIHSS scale

Severity	Main group n = 73		Comparison group n = 50	
	Σ points	%	Σ points	%
Mild degree	4 + 0.30	6, 8	-	-
Medium severity	10.4 + 0.11	56, 1	11.5 + 0.27	48
Severe degree	14.1 + 0.95	37	14.8 + 0.87	52

The analysis of homocysteine showed that its level in patients of the main group was significantly different from that in the control group and correlated with the severity of the course of the disease. Thus, patients of the control group median concentrations and homocysteine in the blood was equal to 7.92 ± 0.74 mmol / l. In patients of the main group with a mild degree, the level of homocysteine in men was 11.6 ± 0.38 μmol / L (p < 0.05), and in women 10.58 ± 0.41 μmol / L (p < 0.05), with an average degree - 17.2 ± 0.66 μmol / L (p < 0.001) and 14.6 ± 0.63 μmol / L (p < 0.05), with a severe degree - $21.2 \pm 1, 9$ (p < 0.001) and 17.9 ± 2.5 (p < 0.001), respectively (tab 2).

Table 2 Serum homocysteine values (mmol / L)

Severity	Main group (n = 73)		Control group (n = 54)
	Men (n = 47)	Women (n = 26)	
Easy	11.6 ± 0.38	10.58 ± 0.41	7.92 ± 0.74
Average	17.2 ± 0.66	14.6 ± 0.63	
Heavy	21.2 ± 1.9	17.9 ± 2.5	

Note: p < 0.05 - statistically significant differences

The results of determining the concentration of serum BDNF are presented in Table 3. As can be seen from the table, in the main group with a mild course of ischemic stroke, the average BDNF content was 2729.0 pg / ml, in patients with an average degree - 2177.2 pg / ml, and in patients with severe degree - 1213.5 pg / ml. At the same time, in the control group, the average BDNF level was 3247.0 pg / ml.

Table 3 Serum BDNF (pg / ml)

Severity	Main group (n = 73)	Control group (n = 54)
Easy	2729.0	3247.0
Average	2177, 2	
Heavy	1213, 5	

Note: $p < 0.05$ - statistically significant differences

Thus, in the course of the study, it was found that the level of homocysteine and brain neurotrophic factor has a correlation with the severity of neurological deficit. The data obtained by us will make it possible to provide an adequate assessment of the prognosis of the outcome of ischemic stroke and rehabilitation potential, as well as to develop an algorithm for a differentiated approach to the prevention of cerebrovascular pathology and reduce the risk of ischemic stroke in young people.

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