Short Reports

DYNAMICS OF BDNF BLOOD SERUM CONTENT AND POLYMORPHISM OF BDNF VAL166MET IN PATIENTS WITH CONSEQUENCES OF ISCHEMIC, HEMORRHAGIC STROKE AND CRANIOCEREBRAL TRAUMA

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The brain-derived neurotrophic factor is considered to be one of neurotrophins performing antioxidative, noothropic function and defining neuron specificity. Relationship of allelic polymorphism of the gene that codes this protein, in particular, Rs 6265, with frequency of schizophrenia, Alzheimer's disease, depression and other psychological diseases development is proven.

Determination of frequency of BDNF Val66Met polymorphism genotypes, studying of change of BDNF blood serum content in group of patients who have had a stroke or a serious craniocerebral trauma was the purpose of the present research. Total 93 patients were observed: 64 (68,8 %) with consequences of an ischemic stroke, 20 (21,5 %) – of a hemorrhagic stroke, 9 (9,7 %) – of a craniocerebral trauma.

Material of research was patients' blood taken from an ulnar vein. Allelic polymorphism was determined with the help of polymerase chain reaction. For determination of polymorphism of Val66Met of BDNF gene oligonucleotide primers were used: 5'-GAGGCTTGACATCATTGGCT-3' and 5 '-CGTGTACAAGTCTGCGTCCT-3', respectively, Val and Met alleles. BDNF content was defined with the help of immune and enzymatic analysis. As control group results of genetic typing of 110 mentally healthy persons was used. The received results – frequencies of alleles and genotypes – are presented in Table 1.

Table 1

Frequencies of alleles and genotypes of BDNF Val66Met polymorphism in the studied groups of patients

Groups of patients	Alleles				Genotypes						Total genotypes
	Val		Met		ValVal		ValMet		MetMet		
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%	
All patients	153	82,3 ± 2,8	33	17, ± 2,8	64	68,8 ± 4,8	25	26,9 ± 4,6	4	4,3 ± 2,1	93
Ischemic stroke	103	80,5 ± 3,5	25	19,5 ± 3,5	43	67,2 ± 5,8	17	26,6 ± 5,5	4	6,2 ± 3,0	64
Hemorrhagic stroke	28	70,0 ± 7,2	12	30,0 ± 7,2	14	70,0 ± 10,2	6	39,0 ± 10,2	0	0	20
Traumatic brain injury	16	88,9	2	11,1	7	77,8	2	22,2	0	0	9
Control group	179	81,3 ± 2,6	41	18,6 ± 2,6	72	65,5 ± 4,5	35	31,8 ± 4,4	3	2,7 ± 1,5	110

Comparison of the studied parameters in groups of patients with consequences of ischemic and hemorrhagic strokes gives evidence of tendency of Met allele quantity increase in the latter, and it is caused exclusively by heterozygous genotype (ValMet). In the course of our research MetMet genotype was found only in persons who have had an ischemic stroke. A small number of observed patients with consequences of traumatic brain injury reduces possibility of interpreting the received results, but the revealed tendency to appreciable quantity of Val allele deserves larger survey.

Average values of BDNF blood serum content in patients with various genotypes are presented in Table 2.

Table 2

Average values of BDNF blood serum content (ng/ml) in patients with various genotypes

Ischemic stroke (n = 64)			Hemorrhagic stroke (n = 20)			Traumatic brain injury consequences (n = 9)		
Genotypes			Genotypes			Genotypes		
ValVal	ValMet	MetMet	ValVal	ValMet	MetMet	ValVal	ValMet	MetMet
26,3	25,4	22,5	25,7	24,5		22,6	18,1	
Average 25,7			Average 24,5			Average 20,3		

In groups with stroke consequences ValVal genotype tends to association with higher BDNF values. To emphasize this tendency, average values of BDNF content in groups of patients whose genotype contained or didn't contain Met allele were compared. Respectively, the ValVal genotype was designated as Met allele – and ValMet and MetMet as Met + (see Table 3).

Table 3

Influence of presence Met allele in genotype on BDNF blood serum content

Groups of patients	Alleles	
	Met –	Met +
All patients	25,7 ng/ml	23,8 ng/ml
Ischemic stroke	26,3 ng/ml	24,7 ng/ml
Hemorrhagic stroke	25,7 ng/ml	24,5 ng/ml
Traumatic brain injury consequences	22,6 ng/ml	18,1 ng/ml

In all compared groups ValVal homozygote gives higher blood serum brain-derived neurotrophic factor content.

The obtained data allow to assume differences in genetic predisposition of ischemic and hemorrhagic strokes development and respectively in the conditions of course of their consequences. One may assume that the persons who have had traumatic brain injury differ from patients with consequences of vascular diseases in respect of BDNF gen allelic polymorphism . It can be of importance for determining the disease prognosis, clinical outcome and differentiated therapy.