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СОПОСТАВЛЕНИЕ КОНЦЕНТРАЦИЙ МОЗГОВОГО НЕЙРОТРОФИЧЕСКОГО ФАКТОРА В СЛЕЗНОЙ ЖИДКОСТИ И ПЛАЗМЕ КРОВИ ПРИ БОЛЕЗНИ ТАКАЯСУ И АТЕРОСКЛЕРОЗЕ

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Аннотация. Актуальность. Болезнь Такаясу (БТ) – это системное воспалительное заболевание, характеризующееся поражением крупных артерий, преимущественно аорты и её ветвей, а также реже артерий лёгких. **Цель исследования.** В данном исследовании проведён сравнительный анализ уровня мозгового нейротрофического фактора (BDNF) в слезной жидкости и сыворотке крови у пациентов с болезнью Такаясу и атеросклерозом сонных артерий. **Материал и методы.** Обследовано 38 пациентов, разделённых на три группы: 15 пациентов с неспецифическим аортоартериитом (БТ), 13 пациентов с атеросклерозом сонных артерий и 10 здоровых лиц. **Результаты.** В результате было выявлено, что уровень BDNF в слезной жидкости и сыворотке крови у пациентов с болезнью Такаясу значительно выше по сравнению с другими группами. **Заключение.** Полученные данные позволяют предположить, что повышенный уровень BDNF может служить ранним диагностическим маркером БТ, а также индикатором развития ишемического процесса, что требует своевременной диагностики и лечения.

Ключевые слова: нейротрофический фактор головного мозга, слезная жидкость, плазма, Болезнь Такаясу.

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COMPARISON OF BRAIN-DERIVED NEUROTROPHIC FACTOR CONCENTRATIONS IN TEAR FLUID AND BLOOD PLASMA IN TAKAYASU'S ARTERIITIS AND ATHEROSCLEROSIS

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Abstract. Relevance. Takayasu disease (TD) is a systemic inflammatory disease characterized by the involvement of large arteries, primarily the aorta and its branches, and, less frequently, the pulmonary arteries. **Purpose of the study.**This study presents a comparative analysis of brain-derived neurotrophic factor (BDNF) levels in tear fluid and blood serum in patients with Takayasu disease and carotid artery atherosclerosis. **Material and methods.** A total of 38 patients were examined, divided into three groups: 15 patients with nonspecific aortoarteriitis (TD), 13 patients with carotid artery atherosclerosis, and 10 healthy individuals. **Results.** The results showed that BDNF levels in tear fluid and blood serum in patients with Takayasu disease were significantly higher compared to other groups. **Conclusion.** The data suggest that elevated BDNF levels may serve as an early diagnostic marker for TD, as well as an indicator of the development of ischemic processes, requiring timely diagnosis and treatment.

Key words: brain-derived neurotrophic factor, tear fluid, plazma, Takayasu disease.

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TAKAYASU KASALLIGI VA ATEROSKLEROZDA BOSH MIYA NEYROTROFIK OMILINING KO‘Z YOSHI VA QON PLAZMASIDAGI KONSENTRATSIYASINI TAQQOSLASH

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Annotatsiya. Dolzarbligi. Takayasu kasalligi (TK) – asosan aorta va uning shoxlari, kamroq hollarda o‘pka arteriyalari zararlanishi bilan xarakterlanadigan tizimli yallig‘lanish kasalligidir. **Tadqiqot maqsadi.** Takayasu kasalligi va karotid arteriyalarining aterosklerozi bo‘lgan bemorlarda bosh miya neyrotrofik omili (BMNO) darajasini ko‘z yoshi suyuqligi va qon zardobida taqqoslash. **Material va usullar.** 38 nafar bemor tekshirildi va uch guruhga bo‘lindi: 15 nafar bemorda TK, 13 nafar bemorda karotid arteriyalarining aterosklerozi va 10 nafar sog‘lom shaxslar nazorat guruhiga kiritildi. **Natijalar.** Такаясу kasalligi bo‘lgan bemorlarda ko‘z yoshi suyuqligi va qon zardobidagi BMNO darajasi boshqa guruhlarga nisbatan ancha yuqori ekanligi aniqlandi. **Xulosa.** Olingan ma’lumotlar BMNO darajasining oshishi TK uchun erta diagnostik marker, shuningdek, ishemik jarayon rivojlanishining indikatori bo‘lishi mumkinligini taxmin qilishga imkon beradi, bu esa o‘z vaqtida diagnostika va davolashni talab qiladi.

Kalit so’zlar: miyadan kelib chiqqan neyrotrofik omil, ko‘z yoshi suyuqligi, plazma, Takayasu kasalligi.

Iqtibos uchun:

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Introduction. Takayasu disease (TD) is a systemic disease characterized by chronic inflammatory lesions of large arteries, mainly of the aorta and its proximal branches, less frequently of the pulmonary artery branches. In generalized forms of the disease, lesions of small caliber arteries may also be observed [1].

According to the literature, it was previously believed that TD is a very rare disease and occurs only in Eastern countries (Japan, India, China, Korea, etc.). However, recent data show that the disease is more prevalent worldwide [2].

According to the Association of Rheumatologists of Uzbekistan in 2017, the incidence of the disease in the republic averages 5.7 cases per 1 million population. There are also certain differences in the incidence of TD between men and women of the republic, the ratio between them is from 1:8.5 to 1:15.

In many cases, ophthalmologic changes may be one of the first signs of vascular disease. Carotid artery pathologies are the cause of acute and chronic circulatory disorders of the visual organ in 15-46% of cases, and this condition has been named "ocular ischemic syndrome" [3,4,5].

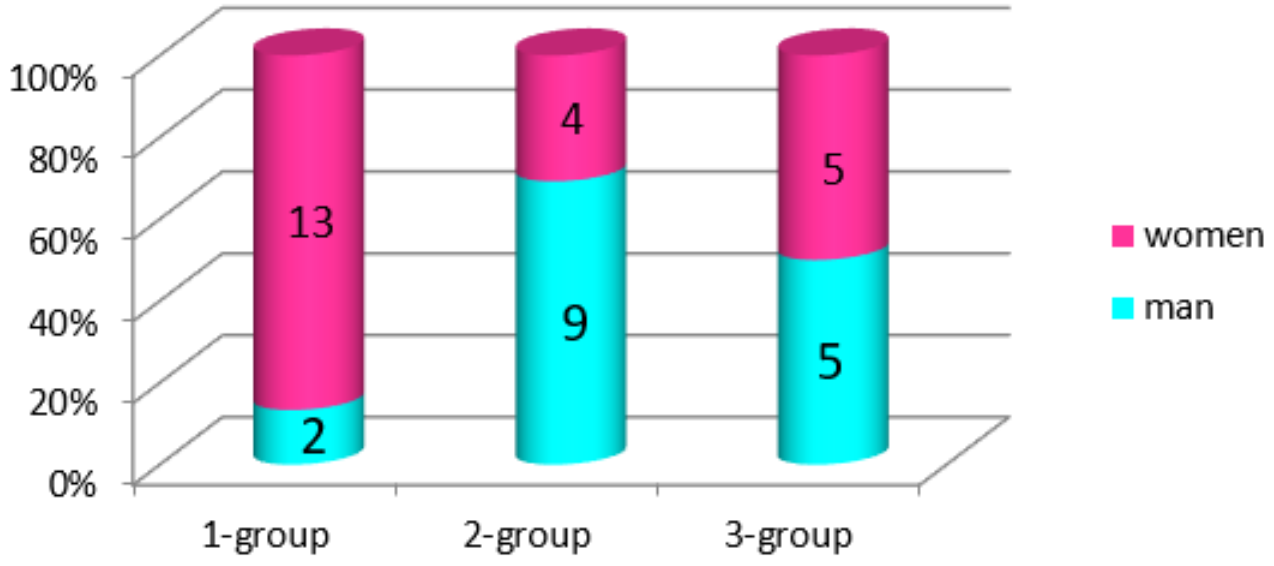

Fig. 1. Distribution of subjects by gender

Table 1

	Lacrimal (pg/ml)	Plazma (pg/ml)	Lacrimal (pg/ml)	Plazma (pg/ml)	Lacrimal (pg/ml)	Plazma (pg/ml)
	1 - group		2 - group		3 - group	
M±δ	137,23±59,47	205,99±101,3	40,59±11,51	63,39±14,21	21,71±5,57	57,33±8,69
M±m	137,23±6,73	205,99±11,33	40,59±1,95	63,39±2,47	21,71±1,11	57,33±1,74
Mediana	122	181,37	41,66	61	21	54,42
Moda	116,9	161	33,1	-	15,5	-
Min.	35,7	76,74	24,5	42,18	15,35	46,8
Max.	321,2	481,45	66	94,6	34	72,6
Correlation (r)	0,165		0,578		0,887	
P value (in group)	0,001		0,001		0,001	

Note. All results are expressed in pg/mL.

Brain-derived neurotrophic factor (BDNF) is one of the important and well-known neurotrophins, which plays an important role in the functioning of the nervous system, in the processes of survival and death of neurons, as well as in the formation of synaptic connections between them, it regulates cell proliferation and differentiation. According to the studies of scientists, a decrease in brain-derived neurotrophic factor affects the development of neurodegenerative diseases.

In the present study, we performed a comparative analysis of BDNF levels in Takayasu disease and carotid atherosclerosis, since these pathologies are the most frequent causes of acute and chronic vascular diseases of the eye and brain.

The aim of our study was to investigate the level of brain neurotrophic factor in lacrimal fluid and blood serum in Takayasu's disease and carotid artery atherosclerosis.

Materials and methods. The study was conducted at the Department of Ophthalmology of the Multidisciplinary Clinic of the Tashkent Medical Academy and the Republican Specialized Center of Surgical Angioneurology. 38 patients aged from 25 to 77 years were examined, the average age was 45±0.5 years. The subjects were divided into 3 groups: Group 1 - 15 patients diagnosed with nonspecific aortoarteritis (Takayasu disease) according to the classification of the American Rheumatology Association in 1990; Group 2: 13 patients diagnosed with carotid artery atherosclerosis based on duplex examination of carotid artery vessels on the Samsung Medison X6 device (Korea); 3 - made up our control group - 10 practically healthy individuals (Diagram 1).

All study participants underwent ophthalmologic examination (visometry, computer perimetry, biomicroscopy, ophthalmoscopy, and tonometry), blood serum, tear composition, and BDNF level were studied by ELISA method.

Results of the study. As a result of the ophthalmic examination, 3 patients (20.0%) of group 1 presented complaints of sharp deterioration of visual acuity in the left eye. Ophthalmoscopy revealed optic nerve atrophy in these patients. Biomicroscopy revealed retinal rubeosis and neovascular glaucoma on the left side in 2 patients (13.3%). In 12 patients (80.0%), despite the narrowing of the internal carotid artery on the left due to acute CT, no decrease in visual acuity was detected. 10 patients (66.6%) complained of short-term transient visual disturbances in the left eye, dizziness, pain in the left arm, absence of pulse, and general weakness. Ophthalmoscopy revealed narrowing of retinal arteries in 14 (93.3%) patients, retinal vein dilatation in 10 (66.6%), and pinpoint retinal hemorrhages and cotton-wool foci in 3 patients (20.0%).

In 15.3%, ocular ischemic sindrom was detected in group 2 patients. Fugax amaurosis (FA) and acute ischemic opticopathy were observed in 1 (7.7%) patient. Central retinal artery occlusion was observed in the 3rd group (23.1%), chronic ischemic neurooptic opathy in 4 (30.7%) patients, and chronic ischemic retinopathy in 3 (23.7%) patients. Ischemic angiopathy of 2 limbs (15.3%) on biomicroscopic examination. On the ocular fundus, arterial narrowing and tortuous veins were observed in all patients (100%), spot hemorrhages on the retina - in 4 (30.7%) patients, and optic disc neovascularization in 1 (7.6%) patient.

The data of laboratory studies showed that the average level of BDNF in serum in the first group was 209.16 pg/mL, while in the second and third groups this index was 68.15 pg/mL and 56.39 pg/mL. It was found that the highest level of the studied protein in the tear fluid was found in the first group of patients (137.25 pg/mL), indicating the specificity of INR for Takayasu disease. The same indicator in the second group was 42.18 pg/mL, in the control group - 29.5 pg/mL (Table 1).

The analysis of the above data showed that the ratio of BDNF levels in serum and lacrimal fluid in the studied groups varies depending on the type of disease. The ratio was 1.52:1 in the first group, 1.61:1 in the second, and 1.91:1 in the control group.

Conclusions. Our study resulted in the following conclusions:

1. BDNF levels are elevated not only in diseases associated with cerebral circulatory disorders but also in systemic diseases such as Takayasu's disease.

2. Elevated BDNF levels in tear fluid and serum may serve as an important early diagnostic sign of Takayasu's disease.

3. Detected changes in the ratio of the studied protein level in blood serum and lacrimal fluid indicate the development of ischemic process and require urgent diagnosis and treatment of patients with the aforementioned diseases.

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