

**BIOMARKERS OF ATHEROGENESIS AND CLINICAL NEUROLOGICAL CHARACTERISTICS
OF THE INTERNAL CAROTY ARTERY**

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Atherosclerosis is a multifactorial and widespread process that underlies the development of cardiovascular and cerebrovascular diseases. Atherosclerotic damage of cerebral vessels is a long-term process that passes through several stages during its development, in particular, the "asymptomatic" stage. Considering that atherosclerotic damage of carotid arteries is widely important in the development of acute cerebrovascular disorders, atherosclerotic damage of internal carotid arteries in patients with asymptomatic stenosis was generally considered as a model of atherosclerosis in brachiocephalic arteries (BSA). In this article, clinical-neurological and dopplerographic indicators of the development of the atherosclerotic process in patients with asymptomatic stenosis of the carotid artery are evaluated.

Key words: *triglyceride, chylomicron, apolipoprotein-A1, atherosclerotic plaque, brachiocephalic arteries, chronic brain ischemia, free cholesterol, phospholipid, lipoprotein*

Atherosclerotic carotid artery disease is one of the main causes of stroke and, together with extracranial carotid artery stenosis, accounts for approximately 20% of all strokes [1]. Previous studies have shown that the average prevalence of asymptomatic internal carotid artery stenosis (>50% stenosis) in the population older than 70 years is approximately 7% in women and 12.5% in men [3]. Patients with asymptomatic internal carotid artery stenosis (IUAAS) have a high risk of ischemic stroke in the ipsilateral carotid artery basin, acute coronary syndrome, and death [4]. Atherosclerosis is one of the leading etiological factors of acute and chronic diseases of cerebral circulation. Atherosclerosis is a progressive inflammatory process that mainly affects large vessels and is characterized by the accumulation of lipids and extracellular matrix proteins in their walls [5]. The multicomponent nature of atherosclerosis as a general somatic and generally systemic pathology determined the development of sometimes fundamentally different concepts about the pathogenesis of this condition in different periods. Thus, among the variety of etiological hypotheses, theories of atherogenesis can be distinguished, for example: autoimmune (AN Klimov, 1975), viral, monoclonal, hormonal, membrane, infectious

(including chlamydia) [6]. Atherosclerosis is characterized by the infiltration of oxidized apolipoprotein-B and cholesterol-containing lipoprotein (LP) into the inner lining of large and medium-caliber arteries, followed by the formation of atheromatous plaques and the growth of connective tissue in the vascular wall [12]. Atherosclerosis of the brachiocephalic arteries (BSA) is a long-term process that can last for decades, and the "asymptomatic" period is considered before the development of clinical signs. BSA stenoses are divided into "symptomatic" and "asymptomatic" types based on the presence or absence of an ischemic stroke in the circulatory basin in the anamnesis.

The purpose of the study: to assess the clinical-neurological and molecular correlation of biomarkers of the development of the atherosclerotic process in patients with asymptomatic stenosis of the carotid artery.

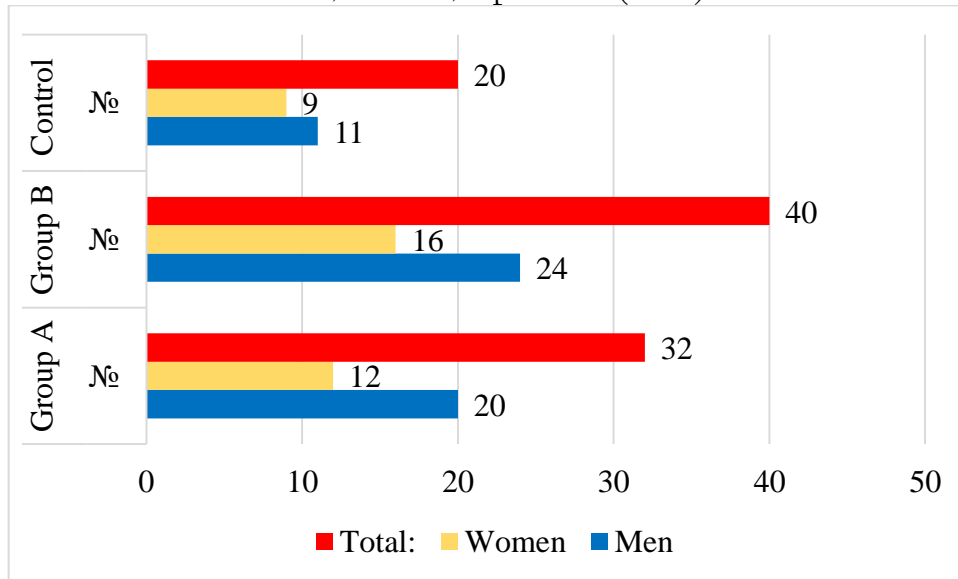
Research material and examination methods: During the study, 72 patients with asymptomatic stenosis of the internal carotid arteries (stenosis level < 50%) and 20 volunteers without symptoms of atherosclerosis were studied (duplex scanning of the main arteries of the head and neck in all patients) conducted). According to current recommendations, internal carotid artery "asymptomatic" stenosis is the absence of focal or permanent neurological signs (ischemic stroke/TIA) in the internal carotid artery basin during the last 6 months. At the same time, in this study, the following patients were included in the study group, patients without a history of cerebrovascular disorders (ischemic, hemorrhagic strokes and TIAs of any etiology) were selected. Also, the patients in the main group were divided into two subgroups: group 1-A consisted of 32 patients who underwent KEAE (classical and emersional methods) at the Republican Center of Specialized Angioneurology, and group 1-B consisted of 40 patients treated at the Department of Neurology of the Tashkent Medical Academy patients were included.

Research results: The average age of patients with asymptomatic stenosis who participated in the study was 62 ± 8 years in group 1-A, and 55 ± 9 years in group 1-B. Among them, 20 men (62.5%), 12 women (37.5%) in group 1-A, and 24 (60%) and 16 (40%) men and women in group 1-B, respectively. In the control group, it was 60 ± 7 years, 11 men (55%), 9 women (45%) by gender (details are given in Table 1 and Figure 1).

Table 1

Ratio of patients by gender

Sex	Grou 1-A		Grou 1-B		Cont Grou	
	No	%	No	%	No	%
Men	20	62,5	24	60	11	55
Wo men	12	37,5	16	40	9	45
Total :	32	100	40	100	20	100



Ratio of patients in the main and control groups by gender

According to the severity rating scale of neurological subjective and objective symptoms: Subjective symptoms were formed according to the above-mentioned complaints of the patients, i.e., as mentioned above, complaints such as headache, tinnitus and memory loss are more common among subjective symptoms. It happened. Objective symptoms were collected during the examination of the neurological status of the patients. Among the objective signs, various sensory disturbances and pseudobulbar signs were found more often than the rest of the patients in both groups. According to the severity of subjective symptoms, the average score in group 1-A was 6.3 points (from 4 to 8), and in group 1-B it was 6 points (from 4 to 9). Objective symptoms were equal to 9.2 points (from 8 to 12) in group 1-A, and 8.9 points (from 7 to 10) in group 1-B. In the control group, the majority of patients (80%) complained of headache. In contrast to the study group, the nature of cephalic syndrome was more variable, 50% of them were migraine, 30% were tension-type headache (TTE), and 15% were hypertensive headaches. came. The results show that among the patients in the control group, headache was the leader among the subjective symptoms. Among the objective neurological signs, various sensory disorders, pseudobulbar syndrome and nystagmus were found relatively more, as in the patients of the main group.

Table 3

Assessment of subjective neurological symptoms of patients

Groups:		A		B		Control	Group
Complaints:	Sex:	N	%	N	%	N	%
Headache	Male	7	31.2	2	20%	3	20%
	Woman	9	31.2	6	20%	4	45%
Noise in the ear	Male	2	18.7	0	0%	2	10%
	Woman	2	18.7	2	10%	3	10%
Sleep disturbance	Male	3	15.6	0	0%	2	15%
	Woman	2	18.7	2	10%	3	10%
Fatigue	Male	2	12.5	0	0%	1	10%
	Woman	6	18.7	2	10%	3	30%
Memory loss	Male	1	18.7	0	0%	2	5%
	Woman	2	31.2	6	20%	4	10%
Mood disorder	Male	1	6.25	0	0%	5	5%
	Woman	1	12.5	1	2.5%	1	5%

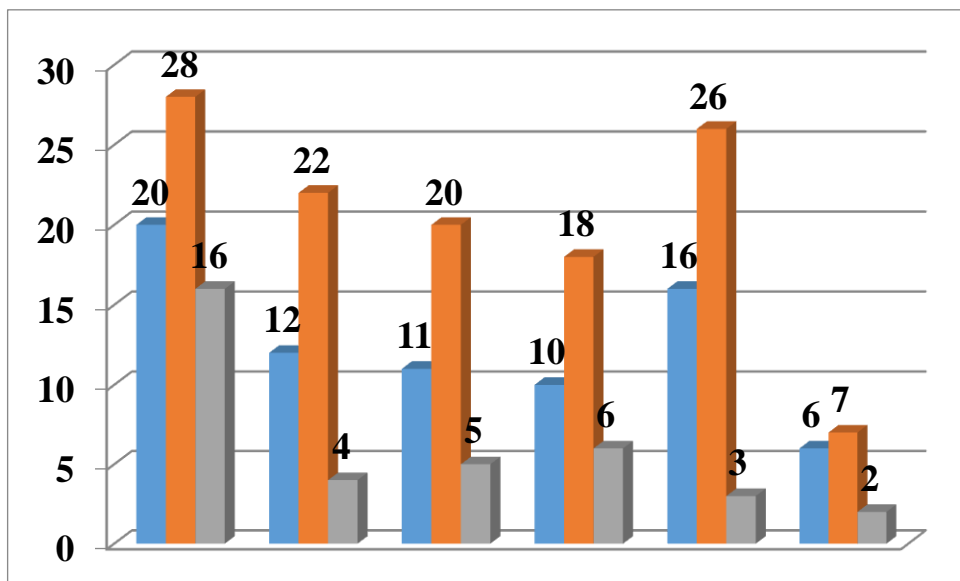


Figure 3 Assessment of patients' subjective neurological symptoms

Table 4**Assessment of objective neurological symptoms of patients.**

Groups:		A		B		Co	G
		-		-		ntrol	roup
Symptoms:	S ex:		%		%	N	%
s	Nystagmu ale	M	3.1 25%		10 %	1	5 %
		A woman	0%		5%	1	5 %
t n	Movemen breakdow n	M ale	3.1 25%		10 %	0	0 %
		A woman	0%		5%	0	0 %
	Tremor	M ale	3.1 25%		5%	0	0 %
		A woman	6.2 5%		7.5 %	1	5 %
ns	Balance breakdow ns	M ale	3.1 25%		5%	0	0 %
		A woman	3.1 25%		5%	0	0 %
rigid syndrome	Akino- rigid syndrome	M ale	0%		2.5 %	0	0 %
		A woman	0%		2.5 %	0	0 %
s	Pseudobu lbar syndrome s	M ale	9.3 75%		15 %	1	5 %
		A woman	3.1 25%		10 %	1	5 %
ns	Intuition breakdow ns	M ale	12. 5%		20 %	2	1 0%
		A woman	9.3 75%		10 %	0	0 %
lability	Emotional lability	M ale	3.1 25%		5 %	0	0 %
		A	3.1		7.5	0	0

	woman		25%		%		%
Speech	M		3.1		5	0	0
	ale		25 %		%		%
breakdow	A		0%		2.5	0	0
	woman				%		%
Other	M		3.1		5	0	0
	ale		25 %		%		%
symptom	A		0%		10	0	0
	woman				%		%

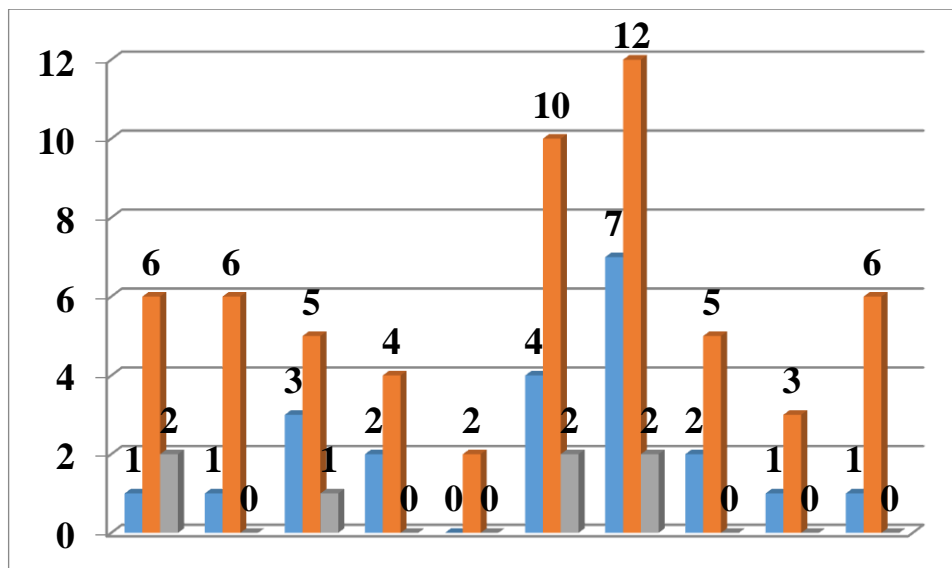


Figure 4: Evaluation of objective neurological symptoms of patients

During the study, Apo-A1 and Apo-B levels were checked in 32 patients of group 1-A at the first stage, i.e. before surgery and 6 months after surgery, and the risk of developing cardiovascular diseases was calculated.

The average level of Apo-A1 in patients before surgery was 1.4 g/l (normally 1.04-2.02 g/l) in men and 1.5 g/l (normally 1, 08-2.25 g/l). After six months, these indicators in patients improved significantly, that is, they averaged 1.6 g/l and 1.8 g/l in men and women, respectively. It is known that the concentration of Apo-A1 in the blood directly affects the concentration of "good" quality cholesterol ZyuLp in the blood, that is, its low concentration reduces the concentration of ZyuLp, and as a result, the risk of atherosclerosis increases. Patients in the study group significantly improved over six months, these changes are directly related to carotid endoarteridectomy and conservative treatment. In accordance with the concentration of Apo-A1, the concentration of ZyuLps also increased, and the risk of atherosclerosis in patients decreased significantly.

In 32 patients of group 1-A, the blood concentration of Apo-B was worse than that of Apo-A1. Before surgery, the average was 1.2 g/l (normally 0.7-1.3 g/l) in men, and 1.15 g/l (normally 0.63-1.17 g/l) in women. did After six months, significant changes are also observed in these indicators: in men and women, these indicators were 1.0 g/l and 0.9 g/l,

respectively. Apo-B is an important indicator like Apo-A1, that is, it affects the concentration of "bad" cholesterol ZPLp and ZJPLp in the blood. High concentrations of Apo-B increase the risk of atherosclerosis inversely to Apo-A1. After six months, the concentrations of ZPL β and ZJPL β were also decreased, corresponding to Apo-B. This is directly related to carotidendoarteritectomy and conservative treatment.

The risk of developing cardiovascular diseases was calculated by the amount of both apolipoproteins in the blood, and the results before surgery and 6 months after surgery were compared (Table 5).

Table 5
Cardiovascular risk indicators (Apo-B/Apo-A1) n=32

Gender:	Before the operation	6 months after surgery
Male	0.86	0.625
A woman	0.766	0.5

Conclusions: The results of the study showed that subjective and objective neurological symptoms significantly decreased for 3 and 6 months in group 1-A patients with asymptomatic stenosis of the internal carotid artery in the treatment stages of recovery of working capacity. During this time, it was found that the statistical reduction of subjective and objective symptoms was more positive than that of patients in group 1-B. The results of the study showed that the blood concentration of Apo-A1 and Apo-B in patients in group 1-A before and after surgery was higher. It was investigated and it was found that these indicators are correlated with the clinical and neurological status of patients. The results showed a strong connection between these two indicators.

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