

# Arterial Hypertension and the Problem of Ischemic Stroke

Umarov R. R., Daminova Kh. M.

Tashkent Medical Academy, Uzbekistan

**Abstract** A comprehensive examination of 101 patients was carried out, among those studied there were 52 men (51.48%) and 49 women (48.51%) aged from 39 to 89 years, who were in the acute period of ischemic stroke (IS). The results of the study showed that the severity of ischemic brain damage depends on the severity of atherosclerotic changes in the great vessels of the head and neck, which is the “background” against which ischemic stroke occurs. Significant risk factors for stroke in patients with carotid stenosis include arterial hypertension and atrial fibrillation. The most vulnerable group of patients are men aged 50 years and older.

**Keywords** Ischemic stroke, Arterial hypertension, Atrial fibrillation, Atherosclerosis

## 1. Relevance

The problem of stroke currently continues to be important and relevant in medical, economic and social terms. About 250000 people a year die from a full-blown stroke in the Russian Federation, and among those who survive, up to 90% become disabled, and 20% of them require help from outsiders. Only 8% of patients are able to return to work and normal life after a stroke [1,7]. The state's economic losses are large due to the loss of the working population of stroke survivors, the costs of social support for the disabled, treatment, rehabilitation and secondary prevention after stroke [2,3,7].

During the year, stroke occurs with a frequency of 400-500 per 100 thousand population. Mortality with stroke reaches 25%, and about 20% of patients who have had a stroke die within a year after it, and about a quarter of patients remain severely disabled [2]. Every fifth patient suffers a recurrent stroke over the next five years [4,6].

Ischemic stroke (IS), according to the World Health Organization (WHO) criteria, is defined as “an acute focal neurological disorder with clinical manifestations persisting for more than 24 hours, the probable cause of which is cerebral ischemia.” Atherothrombotic ischemic stroke is the most common - about 80% of stroke cases are caused by atherosclerotic stenosis and thrombosis [1,6,8,9]. Since atherosclerosis affects extracranial sections of arterial trunks 5 times more often than intracranial ones, brachiocephalic vessels are often affected, which is detected using ultrasound diagnostic methods [5,10,11].

Modern neuroimaging techniques (computer and magnetic resonance tomography, angiographic mode, etc.) make it possible to visualize not only the infarct zone of cerebral

damage, but also to identify the structural features of the vascular system of the brain and its blood supply.

**The purpose of our work** is to assess risk factors for acute ischemic cerebrovascular accident.

## 2. Materials and Methods

The work is based on the results of an open prospective observational study of 101 patients who were in the acute period of ischemic stroke (IS) in the intensive neurology department of the 1st TMA clinic. A comprehensive examination of 101 patients was carried out; among those studied there were 52 men (51.48%) and 49 women (48.51%) aged from 39 to 89 years. Patients with IS were admitted to the admission and diagnostic department of the hospital, where they were examined by a neurologist for 40-45 minutes, computed tomography of the brain with contrast enhancement and CT angiography were performed if indicated, an electrocardiogram (ECG), and laboratory tests of blood and urine. Ultrasound examinations were carried out: Doppler ultrasound of the brachiocephalic arteries (USDG of the BCA), duplex scanning (DS) of the vessels of the head and neck in combination with color Doppler mapping (CDC). If necessary, other studies, analyzes and consultations with specialists (therapist, cardiologist, endocrinologist, rheumatologist, ophthalmologist, neurosurgeon, etc.) were carried out.

## 3. Results and Discussion

The work is based on the results of an open prospective observational study of 201 patients who were in the acute period of ischemic stroke (IS) in the intensive neurology department of the 1st TMA clinic in the period 2022-2025. Among those studied, there were 106 men (52.74%) and 95 women (47.26%) and aged from 39 to 89 years. Depending

on the severity of stenosis of the great vessels of the head and neck, patients were divided into three groups. The division was made on the basis of the NASCET (North American Symptomatic Carotid Endarterectomy Trial) method for assessing the degree of stenosis, where stenoses are conventionally divided into moderate - up to 49%; pronounced - from 50% to 69%, critical - from 70% and above.

Thus, the first (I) group consisted of patients without hemodynamically significant stenotic lesions of the great vessels of the head and neck (0-49% or up to 50% of the vessel lumen), the second (II) - with stenosis 50-69%, the third (III) - from 70% to complete occlusion of the vessel. Group I included 101 patients (50.25%), group II included 52 (25.87%) patients, group III included 48 patients (23.88%). Groups of patients were compared with each other in terms of the course of IS, the size of the ischemic lesion according to computed tomography (CT) of the brain, the severity of neurological deficit and the degree of its recovery, and the functional outcome of IS depending on the severity of carotid stenosis. Criteria for inclusion in the study:

- patients of both sexes aged 18 years and older with ischemic stroke established clinically and according to CT scan of the brain;
- absence of contraindications for neuroimaging methods;
- signing by the patient or his representative of written informed consent.

Patients who refused to sign written informed consent were not included in the study; patients with hemorrhagic stroke; patients who died while in hospital.

As can be seen, the majority of patients were over 60 years of age (52 (25.87%). In the age groups of 50-59 years and 60-69 years, there is a noticeable predominance of men (70 - 66.04%) in relation to women (35 - 36.84%), and in older age groups (70-79 and 80 and more years), on the contrary, there was a significant predominance of females - 31 (32.63%) and 27 (28.42%), respectively, which may indicate a certain "vulnerability" for ACVA of the male contingent in the age range of 50-69 years.

The size of the ischemic stroke focus was determined according to a CT scan of the brain performed upon the patient's admission to the hospital.

Patients included in the study were divided into three groups depending on the severity of carotid stenosis, determined according to BCA ultrasound data upon admission to the hospital. Noteworthy is the increase with age in the probability of developing hemodynamically significant carotid stenosis in patients of groups II and III, especially pronounced at the age of 60-69 years, which confirms the role of age as a risk factor for stroke.

In group I, the cardioembolic subtype of stroke predominated - 47.52% (48 observations), and the atherothrombotic subtype was 40.59% (41 observations). In group II, the atherothrombotic subtype slightly prevailed over the cardioembolic subtype [48.08% (25 observations) and 42.31% (22 observations), respectively]. In group III, the

atherothrombotic subtype predominated significantly and amounted to 56.25% (27 observations) versus the cardioembolic subtype - 35.42% (17 observations). Analysis of other risk factors for stroke shows that the most significant and common are arterial hypertension, diabetes mellitus, heart rhythm disturbances, chronic heart failure, etc.

Thus, arterial hypertension (AH) is a significant risk factor for stroke. Atrial fibrillation was registered in 46 patients of the first group, which accounted for 45.54% of patients in this observation group. Ischemic changes on the ECG (impaired repolarization processes, smoothing of the T wave, displacement of the ST segment relative to the isoline, etc.) were detected in 57 patients (56.43% of patients in the first group), symptoms of chronic heart failure stage 1-3. - in 103 (72.28% of patients in the first group). In the second group, 7 patients (13.46%) had AF, 9 (17.31%) had ischemic changes on the ECG, 25 (15.38%) had CHF. In the third group, AF was observed in 3 (6.25%) patients, Ischemic changes on the ECG - in 7 (14.58%), CHF - in 23 (12.5%) patients. All patients immediately after hospitalization received complex basic therapy for ischemic stroke, including vascular, metabolic and symptomatic drugs.

## 4. Conclusions

Thus, based on the study, it was concluded that the severity of ischemic brain damage depends on the severity of atherosclerotic changes in the great vessels of the head and neck, which is the "background" against which ischemic stroke occurs. Significant risk factors for stroke in patients with carotid stenosis include arterial hypertension and atrial fibrillation. The most vulnerable group of patients are men aged 50 years and older.

---

## REFERENCES

- [1] Belov, Yu. V. Surgical treatment of patients with bilateral lesions of the carotid arteries / Yu. V. Belov, R. N. Komarov, P. A. Karavaykin // *Cardiology and cardiovascular surgery*. - 2014. - T. 5. - P. 35-40.
- [2] Gusev, E. I. The problem of stroke in the Russian Federation: the time of active joint actions / E. I. Gusev, V. I. Skvortsova, L. V. Stakhovskaya // *Journal of Neurology and Psychiatry named after S. S. Korsakov*. - 2007. - T. 107, No. 8. - P. 1-11.
- [3] Gusev, E.I. Neurology and neurosurgery T. 1 / E.I. Gusev, A.N. Konovalov, V.I. Skvortsova // *M., GEOTAR-Media*. - 2022. - 672 p.
- [4] Kadykov, A. S. Vascular diseases of the brain / A. S. Kadykov, N. V. Shakhparonova. - Moscow: Miklos, 2010. - 190 p.
- [5] Lelyuk, V. G. Differential diagnosis in ultrasound angiology / V. G. Lelyuk, S. E. Lelyuk. - Moscow, 2007. - 40 p.
- [6] Pokrovsky, A.V. Ischemic stroke can be prevented / A.V.

- Pokrovsky, V.A. Kiyashko // *Russian Medical Journal*. – 2003. – No. 12. – P. 691.
- [7] Skvortsova, V. I. Modern approaches to the management of patients with stenosis of the carotid arteries / V. I. Skvortsova, N. A. Shamalov // *Consilium medicum*. – 2009. – No. 8. – P. 11–14.
- [8] Arasu, R. Carotid artery stenosis: An approach to its diagnosis and management / R. Arasu, A. Arasu, J. Muller // *Aust. J. Gen. Pract.* – 2021. – Vol. 50, n11. –P. 821–825.
- [9] Bangad, A. Secondary Ischemic Stroke Prevention / A. Bangad, M. Abbasi, A. de Havenon // *Neuro therapeutics*. – 2023. – V. 20. N3. – P. 721-731.
- [10] Keldahl, M. L. Timing of carotid surgery after acute stroke / M. L. Keldahl, M. K. Eskandari // *Expert Rev. Cardiovasc. Ther.* – 2010. – Vol. 8 (10). – P. 1399– 1403.
- [11] The Role of Carotid Stenosis in a Prediction of Prognosis of Coronary Artery Disease / S.P. Jordanova, S. Kedev, D. P. Spirova [et al.] // *Pril (Makedon Akad Nauk Umet Odd Med Nauki)*. – 2021. – Vol. 42, n 1. – P. 53–66.