

ANALYSIS OF THE SUBTYPES OF ISCHEMIC STROKE IN YOUNG AGE

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Abstract: *Objective: to study the risk factors, clinical and pathogenetic features for the subtypes of ischemic stroke at a young age in a comparative aspect. During 2017-2019, 74 patients with ischemic stroke (IS) or transient ischemic attack (TIA) were under observation, 48 men and 26 women. All patients were divided into 2 groups: I-st (main) group included 33 patients aged 20 - 44 years (aged of 40.5 ± 3.1 years); II-nd (comparative) group - 41 patients age group over 60 years (aged of $67,9 \pm 3,9$ years). According to the TOAST criteria, a stroke of an unknown etiology occurred in young people (49%), in old-aged - cardioembolic (39%) and atherothrombotic subtypes (31%). Among the risk factors for ischemic stroke in young people revealed a combination of bad habits, and in the old-aged category, such modulated factors as arterial hypertension, 2nd type of diabetes mellitus, hypercholesterolemia are revealed. These findings confirm the urgency of the problem of cerebral infarction of a young age and the need for further implementation of the latest examination methods and a deeper study of the cardiovascular system.*

Keywords. *Ischemic stroke, young age, TOAST classification, risk factors.*

According to the Development Report (2019), 4.7 million people die from a stroke annually in the world. The proportion of the number of strokes accounts for precisely the working age, less than 20% can return to a full life [12]. Respectively to published data, the frequency of stroke in young people is about 10% [2,3].

As shown by numerous studies, the etiology and pathogenesis of the disease at a young age differ from other age categories of patients, and in many cases remain unknown [8,10,11]. The situation is aggravated by the lack of clear data on the nature of vascular disorders and, in many cases, adequate stroke prevention. [6,15,17]. There were a few research works in the first half of the 20th century devoted to the clinic of stroke in young people, now there is an increased interest in this problem, which indicates a “rejuvenation” of the cardiovascular pathology of the brain [6,15,18].

According to various studies [2,3,4,5,7], the prevalence of stroke at a young age is up to 25 per 100 thousand people per year, and these numbers are increasing year by year with an upward trend in the number of ischemic stroke (IS) [7,10,11]. The generally accepted classification of IS is TOAST classification [9]. According to the criteria of this classification, a pathogenetic subtype due to atherosclerosis of major arteries (arterothromboembolic - ATS) occurs in 15-40% of patients, cardioembolic (CES) accounts for 14-30% of all cerebral infarction, lacunar (LS) - due to occlusion of minor vessels - found in 10-34%, strokes of unknown etiology (cryptogenic) are detected for several equally probable causes in 24-36% of cases, and even in the conditions of a modern highly specialized hospital, it is impossible to reveal the causes of a stroke, thereby causing difficulties in making a diagnosis, and, therefore, prescribing not always adequate treatment for these patients [4,5,16,17]. In some cases, IS at a young age develops as the debut of multiple sclerosis or infection of the central nervous system, and sometimes it is mistaken for functional disorders [1,10,13].

A thorough clinical and neurological examination of young patients with IS in the acute period, including an assessment of cerebral blood flow, hemodynamics, heart function, followed by an expansion of the examination algorithm with the introduction of diagnostic methods into practice, makes it possible to conduct early secondary prevention of stroke. It is important to note that IS in young people is due to the complexity of aspects distinguishable from those in old-aged groups, and to socio-economic factors, which further emphasizes the relevance and complexity of the problem.

Objective: to study the risk factors, clinical and pathogenetic features for the subtypes of ischemic stroke at a young age in a comparative aspect.

Materials and methods. On the basis of the department of anesthesiology, intensive care and neurology of the 1st clinic of Samarkand state medical institute for the period 2017-2019 there were 74 patients with IS or TIA including 48 men and 26 women. Patients were admitted in an emergency. All patients were divided into two groups: group I (main) included 33 patients aged 20 - 44 years (aged of 40.5 ± 3.1 years), 29 of them with IS and 4 with TIA; group II (comparative) - 41 patients age group over 60 years (aged of $67,9 \pm 3,9$ years). The diagnosis was established on the basis of MRI of the brain, additional examination methods (biochemical blood test with determination of lipoproteins and cholesterol, glucose and coagulograms), transcranial duplex scan of cerebral vessels (TCDS), echocardiography, consultation of therapist, ophthalmologist and neurosurgeon if necessary. Assessment of neurological and somatic status in both groups was carried out according to the generally accepted method. The stroke subtype was determined based on the TOAST criteria. Neurological deficit was evaluated on a National Institutes of Health Stroke Scale (NIHSS), modified Rankin scale and Rivermead mobility index at the time of admission to hospital and at discharge, the received data were processed on a personal computer by using SPSS programs.

Results and discussion. The results of the study showed that in the main group according to TOAST criteria, the atherothrombotic subtype was found in 7 (21%) cases. It should be noted the main feature of atherosclerosis of such patients – lateral location of atherosclerotic plaque with relevant complications respectively to the forecast.

In 4 (12%) cases, a cardioembolic subtype of stroke was diagnosed. So, in 2 patients the main factor was rheumatism with rheumatoid defect of the aortic valve, 2 patients had congenital heart defect, besides in 1 patient IS developed on the background of undergoing heart surgery (after 7 months).

In 6 (18%) patients a lacunar subtype of stroke was detected. The main factor in this category of patients was arterial hypertension, which lasted the last 3 years before SI. It should be noted that patients ignored antihypertensive therapy recommendations, 1 patient had arterial hypertension due to kidney disease. Patients with a history of 2nd type of diabetes mellitus (or with a single increase glucose in blood) were 9%. Typically, patients with high blood glucose suffer from increased body weight (abdominal obesity), in the same patients hypercholesterolemia revealed.

In 16 (49%) cases of IS were patients whose etiopathogenesis could not be determined (tab.1). This category of cryptogenic stroke also included 4 patients with TIA. Patients of this type had a history of factors such as smoking in 12 cases. (experience from 10 to 15 years) and alcohol abuse in 7 patients (age closer up to 40 years). 2 patients had varicose veins, 1 patient with AI had a premature birth (cesarean section) for two weeks before the onset of cerebral infarction in the analysis. Thus, this category includes patients with a combination of several risk factors. When studying a family predisposition, the

presence of cardiovascular pathology in the genus such as myocardial infarction, cerebral disease, metabolic disorders was revealed. Hereditary burden of acute cerebrovascular accident was observed in almost 40% of cases.

Table 1: Distribution of patients of the main group with various subtypes of ischemic stroke

Stroke subtype	n =33	%	Gender			
			men		womtn	
			n =21	%	n =12	%
Atherothrombotic	7	21	4	57	3	43
Cardioembolic	4	12	1	25	3	75
Lacunar	6	18	4	66,7	2	33,3
Криптогенный	16	49	12	75	4	25

A characteristic moment in the comparative group was the fact that not all patients were admitted with the development of acute impairment (relatives chose not to transport to the clinic), in this regard, many of them were hospitalized a month or a month and a half after the onset of the disease. As in group I patients with IS were divided into subtypes according to the TOAST criteria. In 13 (31%), an atherothrombotic subtype of IS was detected.. The largest percentage developed against the presence of atrial fibrillation, or after myocardial infarction, in 16 (39%) cases - a cardioembolic subtype of a vascular disorder in the brain. A low percentage was noted for the lacunar and cryptogenic type - 6 (15%) for each case (tab.2). Patients of the latter groups suffered from hypertension, often in combination with 2nd type of diabetes mellitud, and patients suffered from hypertension for more than 15 years. Almost all patients had changes in the heart, increased glucose in the blood, and more than half had metabolic syndrome, in 90% hypercholesterolemia, and in 63% of patients of group II had hereditary complications of stroke ware detected.

Table 2: Distribution of patients in the comparative group with different subtypes of ischemic stroke by gender

Stroke subtype	n =41	%	Gender			
			men		women	
			n =25	%	n =16	%
Atherothrombotic	13	31	8	61,5	5	38,5
Cardioembolic	16	39	13	81,2	3	18,8
Lacunar	6	15	1	16,7	5	83,3
Cryptogenic	6	15	3	50	3	50

Noteworthy is the fact that atherothrombotic and cardioembolic stroke among men was higher than in the comparison group. According to the cardioembolic subtype women in the main group are slightly higher, and in the case of lacunar stroke women in the II group prevail.

When conducting an ultrasound duplex study of the arteries of the head in the main group, atherosclerotic changes, stenosis in 37% and in some cases atherosclerotic plaques were detected. And in cases of the comparison group, stenosis of the lumen of the ipsilateral artery is more than 68%. Additional neuroimaging landmark served as a MRI study, during which, in the best case, there has been confirmation of the presence of foci of ischemic cerebral infarction.

In 90% of patients in group I a lesion of the left hemisphere was observed with the formation of extensive foci of ischemia, the same predominance was in the comparative group, but formation of a lesion in the brain stem in 5–6% of cases, and in the right hemisphere in 3% of cases. Not all patients underwent a neuroimaging examination because of the inability as the patient was. In 10% of cases, there was no data of focal changes on MRI, which was possibly associated with a very early start of the examination.

The clinic of neurological disorders in both groups was comparable in terms of impaired consciousness, speech, pyramidal, sensitive, vestibular and psychological changes (tab. 3).

Table 3: Comparative frequency of neurological symptoms in patients of the studied groups

Neurological disorders	Group I (n=33)	Group II (n=41)
	%	%
Clear consciousness	81,4	79,7
Moderate stun	18,6	20,3
Speech impairment	15,7	21,4
Vestibular-ataxic syndrome	31,4	31,5
Pyramidal muscle tone enhancement	88,6	79,7
Mixed muscle tone enhancement	7,1	20,2
Lack of paresis	0	0
Slight paresis	37,5	44,9
Moderate paresis	48,6	37,1
Pronounced paresis	15,7	18
Pathological reflexes	72,9	80,9
Sensitive Disorders	70	76,4

However, if upon admission the degree of paresis in both groups did not reveal any significant differences, then at discharge it was marked by a sharp difference, in the main group, recovery was rapid and was observed in 40% of the patients examined by us, in the comparative group in patients, recovery was slow and only in 20%.

For a more accurate determination of the recovery of neurological deficit, a rating NIHSS scale was used (fig. 1).

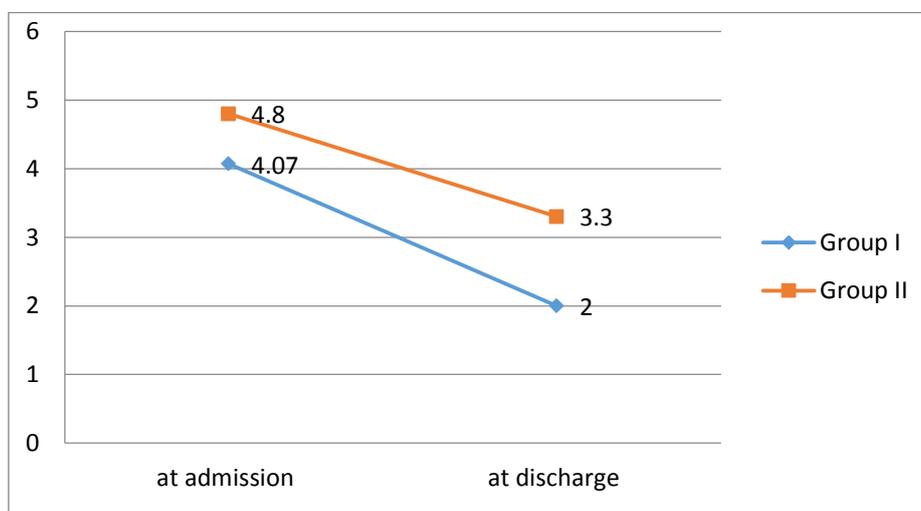


Fig. 1. The pattern of the recovery of neurological deficit in the groups of studied patients according to a NIHSS scale

Our data coincided with the literature data, and corresponded to the dynamics of the clinic. In the young age group, the recovery pattern corresponded to high neuroplasticity, which indicates a large reserve (potential) of the capabilities of the young organism, 46% of patients showed significant dynamics with a decrease in points, in 16% cases increase in the total score, in 10% of cases remained unchanged. The average value at admission in group I was 4.07 ± 3.20 points, at discharge - 2.0 ± 3.1 points; in group II, respectively, at admission - 4.8 ± 3.70 points, at discharge - 3.3 ± 3.5 points. According to the Rankin scale, the average value in group I at admission was 2.20 ± 1.1 points, at discharge - 1.15 ± 1.0 points, in 37% of patients there was a significant decrease in scores, in 20% there was no dynamics. The dynamics of cognitive recovery in the main group was traced by the Rivermead index, here in 53% of cases significant positive dynamics was noted, in 7% without dynamics. The average value in this group at admission was 9.0 ± 4.1 points, at discharge - 12.41 ± 3.3 points.

Thus, having studied the neurological and somatic status, laboratory and instrumental diagnostics, we can conclude, Among the risk factors for ischemic stroke in young people revealed a combination of bad habits, and in the old-aged category revealed such modulated factors as arterial hypertension, type 2 diabetes mellitus, hypercholesterolemia. Moreover, according to the TOAST criteria, a stroke of unknown etiology is found in young people, which confirms the urgency of the problem of cerebral infarction of a young age and the need for further implementation of the latest examination methods and a deeper study of the cardiovascular system. The rapid regression of neurological symptoms and restoration of lost functions that we are observing leads to the need to search for adequate therapy, determine the rehabilitation potential and prevent recurrent cerebrovascular disorders.

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