Published: April 05, 2021 | **Pages:** 133-136

FEATURES OF CEREBRAL HEMODYNAMICS IN ISCHEMIC STROKE ON THE BACKGROUND OF POSTPONED COVID-19

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Abstract: From 2019 to 2020, a total of 141 patients of the neurological department of the Tashkent Somatic Hospital were diagnosed with an acute diagnosis of moderate severity (without loss of consciousness) in the basal carotid artery basin during this period. Among patients with IS - 118 (83.7%) underwent IS against the background of COVID-19. Among them there were 53 (44.9%) men and 65 (55.1%) women. These patients were included in the study group (SG). The remaining 45 people - with IS without a history of COVID-19 - were selected for the comparison group (GC). It was revealed that in patients with ischemic stroke against the background of the transferred COVID-19, patients with CE and LS subtypes of IS were more common. For these patients, no gross disturbances of blood flow through the extracranial arteries were found.

Keywords: COVID-19, ischemic stroke, blood, comparison group, patients, cerebral ischemia, cerebrovascular accidents.

Introduction

Ischemic stroke (IS) in recent decades has been one of the leading causes of death in older age groups. A generalization of the first results of the course of victims of coronavirus infection showed that the development of IS in such patients is very likely. The high mortality rate of elderly patients infected with COVID-19 is partly associated with the development of fatal cardiovascular complications, the most severe of which is stroke (1).

An analysis of the few available publications that mention the problem of COVID-19-associated ischemic stroke can show not only the significance of the problem, but also reveal the mechanisms of acute cerebral ischemia (2). The prevention of acute cerebrovascular accidents (ACVI) in those infected with COVID-19 seems to be one of the important clinical tasks that need to be addressed in conditions of high workload in specialized hospitals and a shortage of specialists.

Published: April 05, 2021 | **Pages:** 133-136

Purpose: To identify the features of the main clinical and diagnostic indicators of cerebral circulation in patients after ischemic stroke against the background of the transferred COVID-19.

Material and research methods: Study design: single center, randomized.

The study included 141 patients from the neurological department of the Somatic Hospital of the city of Tashkent from 2019 to 2020 with an established diagnosis of IS in the basin of the internal carotid artery of moderate severity (without impairment of consciousness) in the acute period. In total, 67 (47.5%) men and 74 (52.5%) women were examined the average age was 52.1 ± 4.8 years. Among patients with IS - 118 (83.7%) had IS against the background of COVID- 19. Among them there were 53 (44.9%) men and 65 (55.1%) women. These patients were included in the study group (SG). The remaining 45 people - with AI without a history of COVID-19 - were selected for the comparison group (GC). The groups were found to be comparable in terms of gender and age.

The study of cerebral hemodynamics was carried out using a duplex-triplex LOGIQ C-5 Premium scanner. Echolocation of extracranial vessels was performed with a linear transducer with a frequency of 10 MHz, visualization of intracranial vessels - using transcranial location with a phased transducer with a frequency of 2.5 MHz. Statistical processing of the obtained data was performed on a personal computer using the program statistics 8.0. The student test is considered reliable at $p < 0.05$.

The study was conducted with the informed consent of the patients.

Results and discussion: According to IS subtypes, SG patients were distributed as follows: atherothrombotic (AT) - 29 (24.6%) people, lacunar stroke (LS) - 48 (40.7%) patients and cardioembolic (EC) - 41 (34,7%) of the surveyed.

In patients with GC, AT was found in 24 (53.3%) patients, CE - in 12 (26.7%) patients and LS in 9 (20.0%) patients.

Thus, among the patients with MG, such subtypes of strokes as LS and CE were significantly more frequent, and in HS - AT.

When comparing the leading syndromes of SG and GC, significant differences in their prevalence within the group were revealed. In the main group, every first patient had a cephalgic syndrome, the absolute majority had astheno-vegetative and more than half of the examined SG had pyramidal insufficiency. Among patients with GC, cephalgic and astheno-vegetative syndromes occurred in no more than 25% of cases.

Duplex scanning of extra- and intracranial vessels revealed the following patterns.

Published: April 05, 2021 | Pages: 133-136

Patients have occlusive processes in the form of tortuosity and stenosis. In SG, tortuosity was found in 21.4%; in the GC, reliably more often in 38.2% of cases. Thus, tortuosity of the carotid arteries was characteristic of patients with IS without a history of COVID-19. There was no statistically significant difference between the parties (p> 0.5).

Atherosclerotic changes were detected in 19.6% of patients with SG and 57.3% of patients with GC. There were no patients with common carotid artery (CCA) occlusion in the study.

Analysis of the linear blood flow velocity (LFV) by CCA in the SG showed a decrease in the left CCA (26.5 cm / s; σ = 3.14) compared with the GC (30.9 cm / s; σ = 3.44; p <0 , 05). Hereinafter, the data are presented as the arithmetic mean (M) and standard deviation (σ).

In patients with GC, there was a tendency to a decrease in the volumetric blood flow velocity in the CCA, and the internal carotid artery (ICA) on both sides. As for patients with GC, the volumetric blood flow velocity in the CCA and ICA on both sides slightly differed from the normal values (table).

Table

Data of volumetric blood flow rate (Q, ml / min) of extracranial arteries in patients with SG and GC (M + σ).

Artery	**SG** (n = 33)	**GC** (n = 54)	**Norm**
CCA	514 ± 96 *	468 ± 91 *	523 ± 89
ICA	276 ± 39 *	213 ± 48 * ^	292 ± 68

Note: * - reliability between groups and norm

(p <0.01), ^ - reliability between groups (p <0.01).

A decrease in the volumetric blood flow rate and an increase in the linear blood flow rate in the extracranial vessels in the group of patients with IS without a history of COVID-19 compared with age norms, which speaks of an atherosclerotic process in the arteries, this explains the predominance of patients with AT subtype IS in this group.

Conclusion

Published: April 05, 2021 | **Pages:** 133-136

Thus, it was revealed that in patients with ischemic stroke against the background of the transferred COVID-19, patients with CE and LS subtypes of IS were more common. For these patients, no gross disturbances of blood flow through the extracranial arteries were found.

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