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Assessment Methods of Clinical-Neurological and Neurovisual Status of Seizure Syndrome After Hemorrhagic Stroke

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Abstract:
The article presents the results of clinical, neurological and neuroimaging assessment of convulsive syndrome after hemorrhagic stroke. Convulsions after a stroke have a high percentage and often end in death, which requires a comprehensive study of this problem, prediction and prevention, and improvement of therapeutic measures.

Key words: *hemorrhagic stroke, seizures, patients, neuroimaging examination*

Introduction

Actuality: All over the world and in Uzbekistan, it is observed that the post-stroke seizure syndrome is reaching high percentage indicators. Cerebrovascular diseases are among the most common causes of paroxysmal conditions, accounting for 25% of the cause of seizure syndrome in people over 60 years old (Holtkamr M. et al., 2017). Stroke accounts for 10% of the cause of seizure syndrome in young and middle-aged adults. Post-stroke seizure syndrome, according to the classification developed by G. Barolin and E. Scherzer in 1962, is as follows: 1) a seizure leading to the development of a stroke; 2) early seizure - during the first 7 days of stroke development; 3) late seizure developing 7 days after the stroke. Epilepsy leads to increased injuries of patients, slow recovery of functions, deepening of cognitive and emotional disorders, and a decrease in quality of life. In Uzbekistan, these aspects of the post-stroke seizure syndrome are not given enough importance, the nature of the disease, diagnosis and rehabilitation measures are lagging, so patients are condemned to live with seizures for many years and the quality of life decreases.

In the treatment of post-stroke seizure syndrome, neglecting the pathogenesis of the disease, clinical-neurological features, and the use of incorrect tactics during an attack require consideration of effective treatment methods. Therefore, a modern approach to the diagnosis and treatment of post-stroke epilepsy, improvement of the correct diagnostic and therapeutic approach is a requirement of the present time.

The purpose of the study: to study the clinical-neurological and neurovisual characteristics of seizures after hemorrhagic stroke, to compare the effectiveness of treatment methods.

Research methods include patient anamnesis collection, clinical-neurological examinations, brain MSCT from neurovisual examinations, duplex scanning of extracranial blood vessels and magnetic resonance imaging (MRT), and clinical-laboratory examinations. Consent for the study was obtained from all patients.

The research work was carried out at the Bukhara branch of the Republican Scientific Center for Emergency Medical Care. 75 patients with post-stroke seizure syndrome who applied to the clinic between 2021 and 2023 were included in our study. Among the patients, men predominated in number, most of them in the age range of 61-80 years.

30 patients were previously diagnosed with IKTS, 20 of them were men (66.7%) and 10 were women (33.3%) aged 42 to 74. 26 patients had evening seizures 8 or more days after stroke, of which 21 men (81%) and 5 women (19%), average age 55 years. IKTS was diagnosed for the first time in 19 patients.

Statistical processing of the obtained results is carried out using Microsoft Excel-2019 and STATISTICA 6.0 on a personal computer. implemented using software packages. The results were presented as mean value (M) and standard deviation (α) for signs with an approximate normal distribution, as well as median (Me) and quartiles for signs with a distribution that differed from the norm. The Shapiro-Wilk criterion was used to decide the type of distribution. To compare independent groups, Student's t-test was used in the case of a normal distribution of the sign and Mann-Whitney's U-test in the case of a distribution different from the norm. For comparison of dependent groups, Student's t-test was used for normal distribution and Wilcoxon test for non-normal distribution. Differences were considered significant at the 95% confidence interval ($R \leq 0.05$). Character correlations were analyzed using the nonparametric method of Spearman's correlation analysis.

Research results: In the acute period after hemorrhagic stroke, seizures were observed in 21 patients. The rest of the patients had previous seizures or tardive seizures. Pathogenetic and clinical characteristics were studied among the groups.

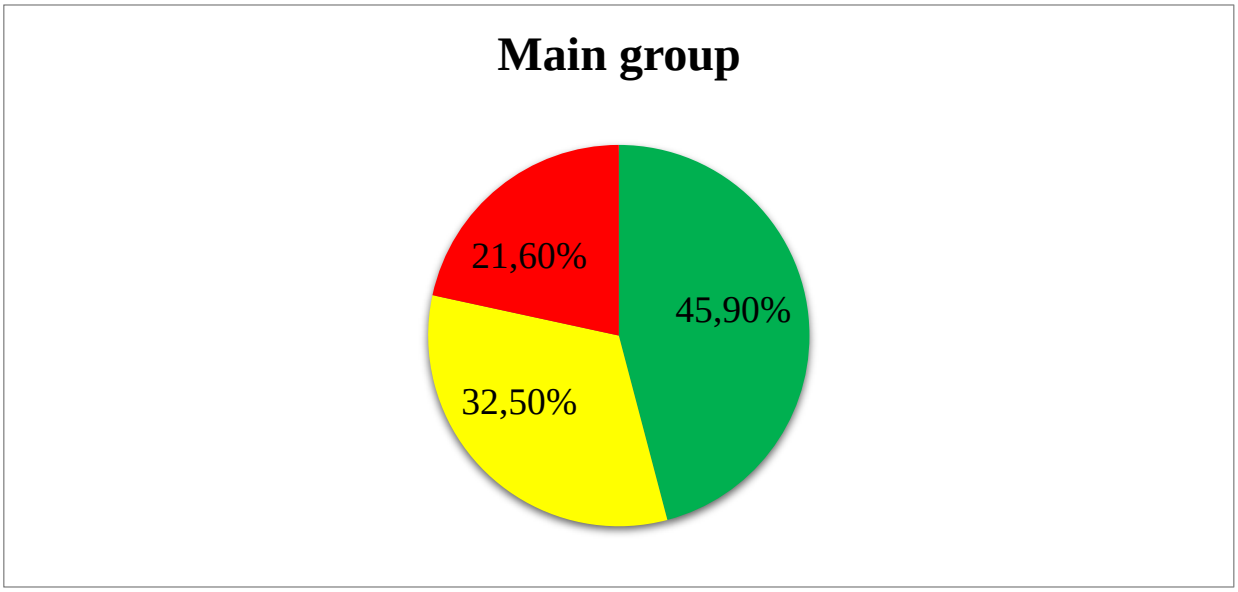
The following cases were analyzed:

1. Hemorrhagic stroke risk factors
2. Hemorrhagic stroke severity
3. Location of the bleeding center

Risk factors in both groups of patients were studied in order to evaluate the effect on the risk of developing epileptic seizures in GI, and the following results were obtained. Arterial hypertension, TIA, PIKS, diabetes, cerebral vascular atherosclerosis, pulsating arrhythmia, hypercholesterolemia, cerebral vascular aneurysm were taken as risk factors.

In the main group of patients, arterial hypertension 72(96.15%), TIA 3(17.31%), PIKS 9(12.50%), diabetes 18(24.03%), cerebral vascular atherosclerosis 61(80.76%), UIK 69(81.73%), ventricular arrhythmia 16(21.15%), hypercholesterolemia 39(51.92%), cerebral vascular aneurysm 3(3.84%) came as risk factors, while control group patients had arterial hypertension 18(60.00%), PIKS 1(3.33%), diabetes 2 (6.66%), atherosclerosis of cerebral vessels 10 (33.33%), CKD 3 (9.99%), hypercholesterolemia 3 (9.99%). Among the risk factors, arterial hypertension, atherosclerosis of cerebral vessels, and IUD prevailed in patients and indicates the need for prevention. Patients were divided into subarachnoid hemorrhage, parenchymatous

hemorrhage, and parenchymatous-subarachnoid hemorrhage according to the localization of hemorrhage.



Picture 1. Distribution of research groups according to the localization of bleeding

In the main group of patients, parenchymatous hemorrhages accounted for 45.9%, subarachnoid hemorrhages for 32.5%, and subarachnoid-parenchymatous hemorrhages for 21.6%. Subarachnoid-parenchymatous hemorrhage has a high percentage of post-stroke seizures.

Postictal neurological deficits were evaluated in patients with seizures. Postictal symptoms include speech disorders (slurred speech, fast, slurred speech), reduced auditory memory, disorientation, and Todd's palsy.

The effect of stroke recurrence on seizure frequency was studied.

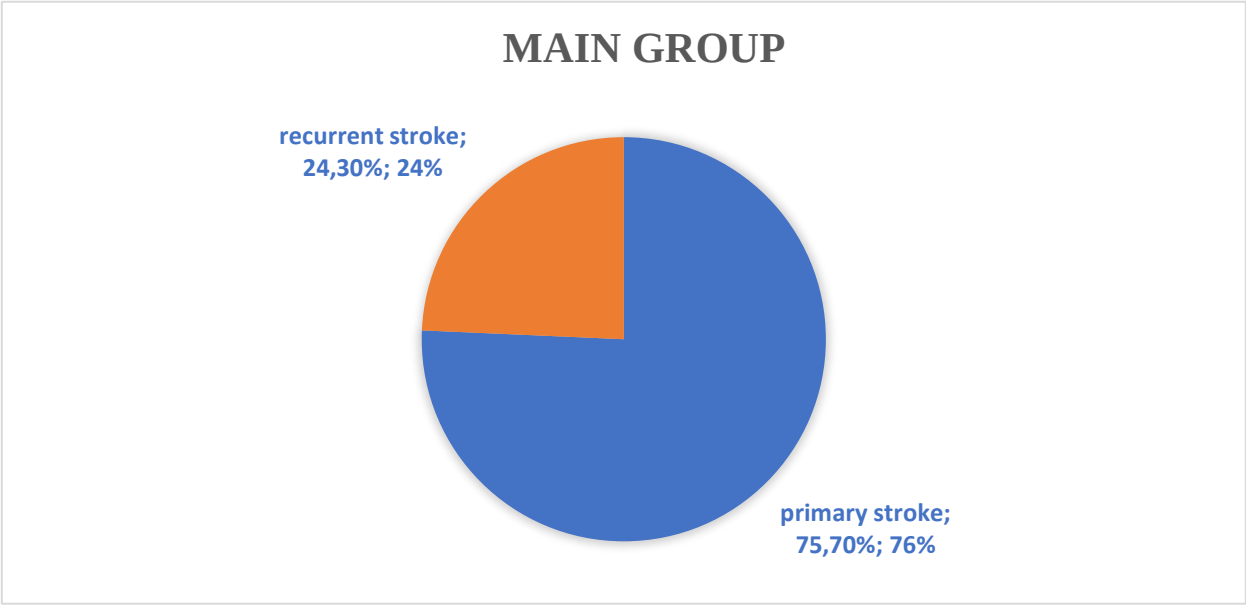


Figure 2. Effect of stroke recurrence on seizure frequency

In patients of the main group, compared to the patients of the comparison group, it was found that seizures were 16.6% more frequent in recurrent stroke. Thus, seizure attacks after hemorrhagic stroke make up high percentages, and this indicator is observed especially often after repeated strokes.

When the seizures observed in the acute period of the stroke were analyzed according to the clinical signs of epileptic attacks, it was found that the clinical signs appear according to the location of the stroke center.

According to the classification proposed by Barolin (1962), attacks were divided according to the time of the stroke. Seizures observed from the 7th day to the 21st day of the stroke were taken as evening attacks.

Table 1

Types of seizure syndrome after hemorrhagic stroke

Seizure type Main group	Main group
Previous seizure	22 (33.84%)
Early seizure	43(66.16%)
Evening seizure	9(13.84%)
Simple partial seizure	6(9.23%)
Complex partial seizure	24(36.92%)
Secondary generalized seizure	35(53.85%)
Recurrent seizures	9(13.84%)

In the main group of patients, 33.84% of seizures existed before the stroke, 66.16% of early seizures, 13.84% of late seizures, 9.23% of simple partial seizures, 36.92% of complex partial seizures, 53.85% of secondary generalized seizures, and 13.84% of recurrent seizures. Secondary generalized seizures predominated in patients of the main group.

The results of the NIHSS scale in the main group patients were 13.45±0.36 points before treatment, and in the control group patients were 13.44±0.47 points (R<0.05).

Every patient included in the study group underwent a CT scan on the first day of referral.

Based on the results of MSKT inspections, the following cases were assessed:

1. Stroke subtypes: subarachnoid hemorrhage, parenchymatous hemorrhage, subarachnoid-parenchymatous hemorrhage.

2. Clarity of focal changes in the brain, focal size.

According to the size, hematomas were divided into the following groups:

• Small hemorrhages (hematoma <20ml)

• medium-sized hematoma (hematoma 20-50 ml)

• Large hematoma (hematoma >50 ml)

The location of the focus in relation to the cortical and subcortical systems of the brain (cortical, subcortical, cortico-subcortical)

1. The location of the focus on the parts of the brain (forehead, temple, top, nape, several sections).

It was found that subcortical system foci are more frequent when examining the brain sections. Cervical hemorrhages were more common in patients of the main group (P<0.05). Thus, the observation of extensive subarachnoid-parenchymatous hemorrhage in several sections is a predictor of the development of seizures in the acute period of GI. Isolated hemorrhages observed in the posterior region of the brain have a relatively small effect on the risk of seizures.

In the main group of patients, the location of the hemorrhagic center in the forehead area was 13.5%, in the temple 43.3%, in the top 13.5%, in the back of the neck 8.9%, several parts 10.8%.

When the location of the focus was studied according to the cortical and subcortical systems, parenchymatous hemorrhages in the main group of patients accounted for 45.9%, subarachnoid hemorrhages in 32.5%, and subarachnoid-parenchymatous hemorrhages in 21.6%. Therefore, parenchymatous and subarachnoid hemorrhages predominate in the main group of patients.

When the foci sizes were studied, the main group of patients had small hemorrhages in 29.7%, medium hemorrhages in 56.80%, and large hemorrhages in 13.5%.

Conclusion: Changes in the autonomic nervous system (in our example, increased tone of the sympathetic nervous system) in patients with seizure syndrome after hemorrhagic stroke require correction. Based on the above information, the autonomic nervous system tests are used to determine the tone of the sympathetic and parasympathetic nervous system.

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