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BALANCE DISORDERS IN PATIENTS WITH CEREBELLAR ISCHEMIC STROKE, DIAGNOSIS AND TREATMENT

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Abstract: Patients with cerebellar ischemic stroke underwent examination of neuropsychological and stabilometric tests of cognitive functions and balance disorders at different stages of the disease. 90 patients took part in the study. The results of the study showed that, according to the results of computer stabilometric treatment methods, patients improved gait by 33.5% and balance by 28.5%, which led to restoration of lost movements and functions, as well as prevention of possible complications that may arise due to the patient's limited activity and improves the patient's emotional recovery in the post-stroke period.

Key words: cerebellar ischemic stroke, balance, gait, stabilometric training.

Currently, acute cerebrovascular accident (ACVA) is an urgent medical and social problem of modern medicine. In 2018, the incidence of stroke cases reached 2.5–3.5 per 1 thousand population. Atactic disorders in stroke develop in 38–46% of cases, which leads to frequent falls. Almost half of elderly people who have suffered repeated falls develop a feeling of fear and anxiety, which leads to a limitation of daily activities and increases the burden on relatives and loved ones.

Ataxia (from the Greek ataxia - disorder) - a disorder of motor coordination; a very common motor disorder. Strength in the limbs is slightly reduced or completely preserved. Movements become inaccurate, awkward, their continuity and consistency are disrupted,balance is disturbedwhile standing and walking. Static

ataxia is a violation of balance in a standing position, dynamic ataxia is a violation of coordination when moving.

Normal coordination of movements is possible only with highly automated and cooperative activity of a number of parts of the central nervous system - conductors of deep muscle sensitivity, the vestibular apparatus, the cortex of the temporal and frontal regions and the cerebellum - the central organ of coordination of movements. Cerebellar ataxia- a consequence of damage to the cerebellar vermis, its hemispheres and peduncles. In the Romberg position and when walking, the patient falls over (up to falls) towards the affected cerebellar hemisphere. If the cerebellar vermis is damaged, it is possible to fall to any side or backward. The patient staggers when walking and places his legs wide. The flanking gait is severely impaired. Movements are sweeping, slow and awkward (more so on the part of the affected cerebellar hemisphere). Coordination disorder is almost invariable during visual control (open and closed eyes). There is a disturbance in speech - it slows down, becomes stretched, jerky, and oftenchanted. Handwriting becomes splayed, uneven, andmacrography. There may be a decrease in muscle tone (more on the affected side), as well as a violation of tendon reflexes. Cerebellar ataxia may be a symptomencephalitisof various etiologies,multiple sclerosis, malignant neoplasm, vascular lesion in the brainstem or cerebellum.

Cerebrovascular disorders are characterized by disturbances in postural balance, severity of paresis, changes in muscle tone, emotional symptoms, damage to the visual and vestibular analyzers, and seizures. Clinical manifestations of the disease are aggravated by the presence of cognitive disorders and depressive disorders. Statolocomotor disorders are manifested by difficulty in stable standing and gait due to disorders at various levels of the complex balance control system in such patients. This explains the importance of studying balance in post-stroke patients and developing the most appropriate methods for the rehabilitation of patients with statolocomotor disorders.

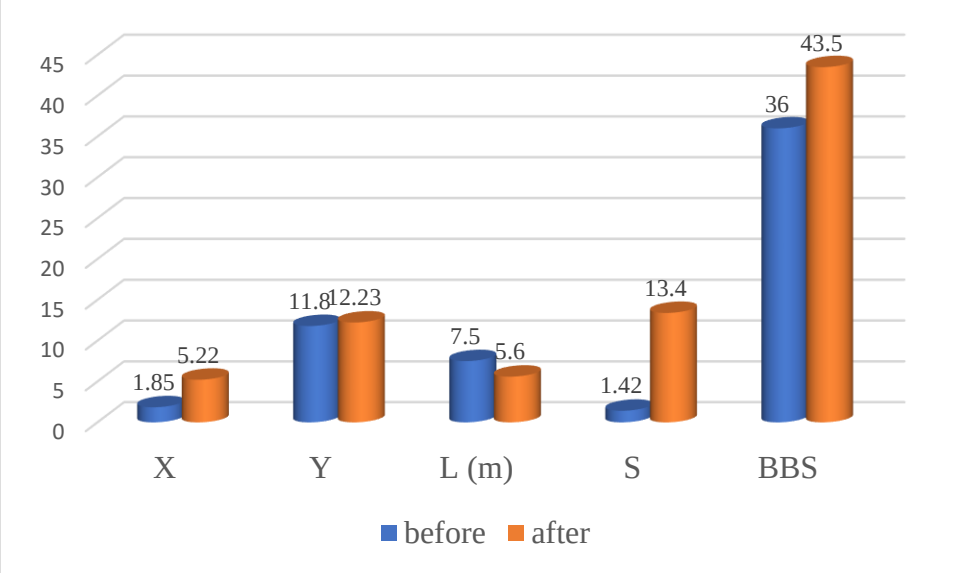
Purpose of the study: to identify balance disorders at an early stage after a cerebellar stroke and carry out adequate therapeutic measures.

Materials and methods. The study included 90 people: 58 (64.5%) females, 32 (35.5%) males. The age in the general group corresponded to the middle and elderly age categories according to the classification. Research hypothesis: the use of a method based on shifting a person’s center of gravity along the vertical axis in combination with stimulation of proprioception improves balance and walking function; reduces the risk of falls in vestibulocerebellar ataxia of post-stroke origin. The object of the study was the indicators of balance and walking function in patients

with vestibulo-cerebellar ataxia after acute cerebrovascular accident in the vertebrobasilar region in the early and late recovery periods. The subject of the study is methods and results of correction of vestibulo-cerebellar ataxia in patients in the early and late recovery periods of ischemic stroke in the VBB. Units of observation – patients after ischemic stroke VBB 10 in the early and late recovery periods, primary documentation, patient card. Accounting characteristics: results of an objective assessment of the state of equilibrium using the method of computer stabilometry (CS) - displacement of the common center of mass (CGM) along the X and Y axes, area of the statokinesiogram (S), length of the GCM path (L), speed of the GCM displacement (V); data from a laser analyzer (LA – 1) of kinematic walking parameters – step length (LS) and step time (ST), walking speed (v), step variability coefficient (STV) for step length and time, standard deviation of step time and length (StDev.); results of functional scales - Berg Balance Scale, Dynamic Gait Index, fall effect scale based on materials from M. Tinetti et al.

Stabilometric training was conducted for 30 minutes, 2 times a day for 20 days. After treatment, a second test was carried out which showed a positive result.

Research results. In the study, normative indicators calculated in clinically healthy middle-aged individuals were compared with indicators obtained before treatment in patients with vestibulocerebellar ataxia after a stroke. The patients had changes in walking and balance parameters according to the CS, LA - 1 and functional scales, which were clinically consistent with the ataxic syndrome.



After the course of treatment, there was an improvement in walking function, which was confirmed ($p < 0.05$) by changes in the following indicators: average length and time of step, standard deviation of length and time and step, coefficients of

variability of step length and time, average walking speed, which indicates to reduce the severity of ataxic syndrome while walking.

According to the fall effect scale based on materials from M. Tinetti et al. (1990) obtained statistically significant improvements in all three groups, which indicates a subjective reduction in the fear of falling as assessed by the patient's self-assessment. On the anxiety and depression scale, most of the patients had an average score within the normal range or subclinically expressed anxiety or depression; after treatment, the indicators approached the normal limits, but did not have statistically significant confirmation.

Conclusion. In case of cerebellar strokes associated with balance disorders, the use of stabilometric exercises in the early stages of the disease can lead to a reduction in the rehabilitation period in patients. Considering comparable results on the main indicators of objective and subjective methods for assessing balance and walking function, we can assume equal effectiveness of all three methods. At the same time, it can be used for more severe ataxic disorders and cognitive deficits, in the presence of contraindications to other methods. Considering the absence of active actions on the part of the patient in the stabilometric training technique, but only passive displacement along the vertical axis, it is possible to use this technique in patients with severe cerebellar and vestibulocerebellar ataxia of post-stroke origin.

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