POSTURAL IMBALANCE IN BEAVERS WITH DISCIRCULATORY ENCEPHALOPATHY

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Disruption of postural functions is one of the main symptoms of dyscirculatory encephalopathy, a chronic brain disease characterized by degeneration of the substantia nigra of the midbrain. Checking the postural balance by stabilometry in patients with discirculatory encephalopathy and treating the pathological changes detected by them with citicoline drug for 10 days leads to the recovery of postural disorders.

Keywords: postural imbalance dyscirculatory encephalopathy

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Postural balance is the ability of a person to stand and perform movements without hesitation or falling. It is provided by the integration of information from visual, vestibular and proprioceptive analyzers into the central nervous system [1, 2]. Disruption of postural functions is one of the main symptoms of dyscirculatory encephalopathy, a chronic brain disease characterized by degeneration of the substantia nigra of the midbrain [3]. Dyscirculatory encephalopathy is one of the most common neurodegenerative diseases in the world, characterized by the development of motor disorders in the form of hypokinesia, muscle stiffness, resting tremor, postural imbalance, as well as a wide range of non-motor manifestations [4, 5]. According to WHO forecasts, the number of people with dyscirculatory encephalopathy in the world will exceed 9 million in 2030 due to the increase in average life expectancy [6]. Postural instability develops in the later stages of dyscirculatory encephalopathy and is characterized by impaired balance function, which leads to frequent falls. It is one of the most unfavorable factors of the disease, which deprives the patient of independence, increases the risk of injury and significantly increases the level of disability [7]. In addition to falls, postural disorders are characterized by a change in muscle tone, which leads to the development of a bent position ("the questioner's position"); in severe cases, the development of camptocormia, the body may bend forward. . Some patients develop Leaning Tower of Pisa syndrome, in which the body deviates in the coronal plane. Postural disorders include microbasia, freezing during walking, and locomotion [8, 9]. Thus, postural disorders in a broad sense can accompany patients from the initial stage of dyscirculatory encephalopathy [7]. One of the highly informative methods of studying postural functions is stabilometry [10]. By measuring the position of the center of pressure, as well as its trajectory and speed of movement, it allows to objectively determine the degree of postural disorders, evaluate the

ongoing therapy and predict the course of the disease [11] . the possibility of using stabilometry to diagnose postural disturbances in patients with dyscirculatory encephalopathy [12–15] motivated this study. The aim of the study was to assess the level of postural disorders in patients with dyscirculatory encephalopathy. Tasks of the research: 1. To provide clinical features of patients with dyscirculatory encephalopathy; 2. conducting a stabilometric study in patients with dyscirculatory encephalopathy, as well as in the control group; 3. Assess the degree of postural disturbances in patients with dyscirculatory encephalopathy compared to controls. Two groups of patients were examined: the first (main) group included 30 patients with dyscirculatory encephalopathy, and the second (control) group included 30 individuals without symptoms of dementia, comparable to the main group in terms of age and gender. All subjects underwent complete anamnestic and clinical screening, which was performed by stratified randomization using inclusion and exclusion criteria developed in accordance with the aims and objectives of this study. A stabilometric study was conducted to determine the presence and severity of postural disorders using the ST-150 diagnostic platform. patients with dyscirculatory encephalopathy were studied during the period when the effect of antiparkinsonian drugs was maximal. Stabilometry was conducted in a closed room with a sufficient area (20 m2) to prevent acoustic orientation of the patient in space with the presence of a doctor; the stabilometric platform was installed at a distance of more than 1 meter from the walls; any noise noises that could distract the subject's attention were excluded, the total sound level in the room did not exceed 40 dB (ISO); The light intensity in the room was 40 lux. During the study, the patient stood on a platform in socks according to the European version of foot placement (ankles together, toes at an angle of 30 degrees). The choice of such a location of the legs is related to its naturalness and maximum convenience for the subject, as well as the fact that the axes of the subtalar joints are parallel and strictly oriented in the sagittal plane [10]. Before conducting the stabilometric study, the following individual parameters of the subject, necessary for calculating the stabilometric characteristics, were measured: 1) leg length (mm) - the distance from the back surface of the heel tubercle to the nail phalanx of the most protruding toe; 2) ankle distance (mm) - the distance from the projection of the top of the outer ankle to the base plane to the nail phalanx of the most protruding finger; 3) Clinical base (mm) - the distance between the front upper iliac vertebrae; 4) Height (mm). After placing the feet on the platform, the subject assumed a vertical position. The Romberg test was used according to the European version of leg placement, which is performed in 2 stages: eyes open and eyes closed. the second (control) group included 30 individuals without dementia symptoms, age and sex-matched to the main group. All subjects underwent complete anamnestic and clinical screening, which was performed by stratified randomization using inclusion and exclusion criteria developed in accordance with the aims and objectives of this study. A stabilometric study was conducted to determine the presence and severity of postural disorders using the ST-150 diagnostic platform. patients with dyscirculatory encephalopathy were studied during the period when the effect of antiparkinsonian drugs was maximal. Stabilometry was conducted in a closed room with a sufficient area (20 m2) to prevent acoustic orientation of the patient in space with the presence of a doctor; the stabilometric platform was installed at a distance of more than 1 meter from the walls; any noise noises that could distract the subject's attention were excluded, the total sound level in the room did not exceed 40 dB (ISO); The light intensity in the room was 40 lux. During the

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During registration with open eyes, the subject focused his gaze on a special sign (a red circle with a diameter of 5 cm) located in front of the patient's eyes at a distance of 2 meters; during the closed-eyes phase, the subject closed his eyes on computer command and continued to hold the given position. The meaning of the MH phase is that the influence of the visual analyzer is excluded and the vertical position is maintained only due to proprioception. Each phase of the study was carried out for 28 seconds. The study was stopped and restarted when there were distractions that could distort the results: coughing, scratching, turning the head, any speech, external noise and other stimuli. The following main indicators of stabilometry were analyzed: 1. The average position of the center of pressure - describes the position of the CP in the coordinate system (X, Y) of the base of support, which reflects the global characteristics of body balance. (displacement in the sagittal and frontal axis); 2. The area of the statokinesiogram (S) is a part of the plane bounded by the curve of the statokinesiogram. In the mathematical equivalent, it is an ellipse that covers 90% of all measurements during the study; 3. CD movement speed (V) - describes the distance covered by the CD in a unit of time; 4. Romberg coefficient (QR) - the ratio of the statokinesiogram area in the OG phase to the statokinesiogram area in the SG phase, expressed as a percentage; used to quantify the relationship between the visual and proprioceptive balance control systems in basic stance.

Research results As more than 50% of quantitative data are normally distributed, descriptive statistics for them are presented in the form of mean (M) and standard deviation (SD). Nominal data were analyzed using Pearson chi-square. The critical level of test significance was determined at $p \leq 0.05$. Results of the study The first group consisted of 30 patients diagnosed with dyscirculatory encephalopathy: 15 (50%) women and 15 (50%) men aged 50 to 82 years, average age - 65.97 ± 8.33 years . The most common complaints of patients were stiffness of limbs (27 patients or 90%), slowness of movements (23 patients or 76.7%) and tremors of hands (22 patients or 73.3%). Less common complaints were stride shortening (13 patients or 43.3%), postural changes (11 patients or 36.7%) and leg tremor (8 patients or 26.7%). 7 (23.3%) patients complained of freezing while walking. The duration of the disease varied from 0 to 16 years and averaged 4.4±3.4 years. essential tremor of dyscirculatory encephalopathy was diagnosed in 18 (30%) patients, hypertonus - 7 (11.7%) and ataxia - 5 (8.3%).

The 10-day equivalent dose with citicoline was 387.5 ± 53.3 mg/day. The second (control) group included 30 volunteers: 22 (73.3%) women and 8 (26.7%) men, aged 48 to 76 years, average age 62.5±6.95 years. Individuals in the control group were statistically compared with the main group according to the table.

	Before treatment	After treatment	p
essential tremor	18 (30%)	15%	0.05
hypertonus	7 (11.7%)	6.54%	0.05
ataxia	5 (8.3%)	4.2%	0.05

Summary. Checking the postural balance by stabilometry in patients with discirculatory encephalopathy and treating the pathological changes detected by them with citicoline drug for 10 days leads to the recovery of postural disorders.

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