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DIAGNOSTICS AND CORRECTION OF VESTIBULAR, AUTONOMIC AND VASCULAR DYSFUNCTIONS ON THE BACKGROUND OF DEGENERATIVE CHANGES IN THE CERVICAL SPIN

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Abstract

Studies in 82 patients were aimed at optimizing the diagnosis and treatment of vestibular dysfunctions with vegetative-vascular disorders during degenerative changes in the cervical spine.

The main symptoms of vestibulopathy were dizziness as well as their provoking and related causes. Obtained objective state data of the vestibular analyzer using the integrative index of ataxia, the state of autonomic characteristics, data of the psychoemotional and cognitive sphere. The author's method of treating such conditions using a complex of vegetotropic, vascular, nootropic drugs, as well as intranasal electrophoresis, was used. Positive results were obtained for this type of therapy for vestibulopathy and autonomic vascular disorders.

Keywords: vestibular dysfunction; autonomic dysfunction; chronic cerebral ischemia; degenerative-dystrophic changes in the spine; treatment

ДИАГНОСТИКА И КОРРЕКЦИЯ ДИСФУНКЦИЙ ВЕСТИБУЛЯРНОЙ АВТОНОМНОЙ И СОСУДИСТОЙ СИСТЕМ НА ФОНЕ ДЕГЕНЕРАТИВНЫХ ИЗМЕНЕНИЙ В ШЕЙНОМ ОТДЕЛЕ ПОЗВОНОЧНИКА

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Проведены исследования у 82 пациентов с целью оптимизации диагностики и лечения вестибулярных дисфункций с вегетативно-сосудистыми нарушениями при дегенеративных изменениях в шейном отделе позвоночника. Выявлены основные симптомы вестибулопатии. В первую очередь - головокружения, а также причины их провоцирующие и сопровождающие. Получены объективные данные состояния вестибулярного анализатора при помощи интегративного индекса атаксии, состояния вегетативных характеристик, данным психоэмоциональной и когнитивной сферы. Применен авторский способ лечения таких состояний с использованием комплекса вегетотропных, сосудистых, ноотропных средств, а также интраназального электрофореза. Получены положительные результаты такого рода терапии вестибулопатий и вегетативно сосудистых расстройств.

Ключевые слова: вестибулярная дисфункция; вегетативная дисфункция; хроническая ишемия мозга; дегенеративно-дистрофические изменения позвоночника; лечение

Relevance. The urgency of the problem is associated with the fact that vestibular dysfunctions (VD) are one of the most common syndromes in chronic and acute disorders of cerebral circulation, especially of cervical origin with the presence of severe disorders of the autonomic nervous system (ANS) [1-3].

Purpose of work. The aim of the work was to optimize the diagnosis and treatment of VD with vegetative-vascular disorders during degenerative changes in the cervical spine based.

82 patients with VD were examined (42.7% of men; 57.3% of women), age from 18 to 55 years, average age 38.0 ± 1.5 years. Patients were divided into the main (n = 62) and

control (n = 20) groups. All patients showed vegetative disorders according to the questionnaire by A.M. Vein [4].

The discussion of the results. The main symptoms of triggering and / or accompanying pathological mechanisms of vestibulopathy were identified. Dizziness was registered in 100.0% of cases, in 52.4% it was not systemic, and in 47.6% it was systemic, it was mainly provoked by physical exertion (25.6%), movements of the head (39.0%), orthostatic changes (14.6%), fluctuations (usually increase) in blood pressure (9.8%). The causes provoking dizziness: orthostatic (14.6%), physical activity (25.6%), turns and head movements (39.0%), increased blood pressure (9.8%), paroxysmal pain in the neck (9.8 %), head tilting (15.8%) or a combination thereof.

Headaches (75.0%) in the pathogenesis had a vascular and / or autonomic component: vasomotor cephalgia (24.2%), ischemic-hypoxic (48.3%), venous character (27.4%). Localization: diffuse (40.3%), in the occipital (33.9%), parietal (14.5%), frontal (11.3%) areas.

Algic syndrome was manifested by pain in the neck (68.2%) and mainly in the process of movements, muscle weakness (58.5%). The algii was characterized by involving into one of the shoulders and the corresponding arm (37.5). Back pain (56.1%), cardialgia (37.8%) and other pain phenomena were noted. The muscle tension of the shoulder girdle and neck was recorded in 48.8%, which were both reflex-tonic and generalized in nature, while they had a pronounced vegetative accompaniment, including with angiospasm of superficial, local and main vessels.

The most significant symptoms are an increase in blood pressure (59.7%), noise in the head (39.0%), hearing loss (30.5%), orthostatic hypotension (18.3%). In a number of cases asthenia (42.7%), emotional lability (58.5%) were recorded, which was regarded as manifestations of the pseudoneurotic syndrome characteristic of chronic brain ischemia (ChEM). In addition, cognitive disorders (70.7%), dissomnia (39.0%), and so on.

An objective examination of the vestibulo-postural conduction [5] was dominated by moderate vestibular disorders detected using the Romberg pose in the form of swaying (68.3%). Small amplitude nystagmus, as well as nystagmoid movements without currently visible vestibular disorders were recorded. Extravasal compression often triggered the latter.

Mild to moderate vestibulo-atactic disorders were determined [6]. The indices of the integral ataxia index (IIA) significantly increased from functional manifestations (average values - 2.3 ± 0.13 units ($P < 0.05$) in relation to healthy subjects - 1.8 ± 0.09 units with the syndrome of autonomic dystonia (SAD) before chemotherapy, as well as with the increase in

ischemic brain damage (in the compensated stage of ChEM - 2.6 ± 0.11 units, with subcompensation - 3.5 ± 1.12 units, ($P < 0.05$), while high IIA numbers accompanied the presence of severe vagotonia (3.0 ± 0.62 units versus 2.3 ± 0.09 units with eutonia ($P < 0.05$).

In the study of the vegetative portrait of patients, autonomous characteristics were pathological (96.3%), vegetative tone (VT) was shifted towards vagotonia (52.4%), pathological VR in 84.1% mainly had pathological implications (52.4%), pathological variants of autonomic reactivity increased with increasing ischemic brain damage. Changes in vegetative accompaniment of activity (VAA) in 86.6% were manifested by insufficiency (47.6%) or redundancy (39.0%) of provision. In the presence of ChEM, the deficiency increased significantly (up to 96.9%, $P < 0.01$). The number of cases of water deficiency increased in the presence of menopausal syndrome (up to 61.5%, $P < 0.05$), while it was always pathological.

Clinically significant depression [7] was recorded in 58.8%, with 80.8% being women ($P < 0.05$), and in cases of menopausal syndrome it reached 96.1% ($P < 0.05$). With vagotonia, these indicators were 100.0% in men and 60.5% in women. Anxiety was noted in 30.5% without gender differences, however, it was more often detected in the compensated stage of ChEM and also occurred in younger (by 6.7 ± 1.2 years) in comparison with depressive episodes. With dyshormonosis, it occurred much more often (71.1%), with a predominance of the sympathicotonic background of VT (52.0%).

With regard to cognitive impairment, there was a clear tendency to decrease in performance depending on the degree of damage to the central nervous system.

Manifestations of cervical osteochondrosis were diagnosed in all patients. Instability of the cervical spine was noted in half the cases of the examined patient population, more often in segments C4-C5 (78.0%, $P < 0.05$), less often - C3-C4 and C5-C6. Uncovertebral arthrosis - in 42.6%.

In ultrasound dopplerography, the resistance index (RI) of the blood flow in the vertebral arteries (VA) exceeded the normative values in the direction of angiospasm, in the presence of functional disorders, the average RI was interpreted as dystonic, and in the case of ChEM, persistent cerebral angiospasm was recorded, especially against the background of sympathicotonia (reaching 0, 73 ± 0.09 units, $P < 0.05$), in cases of aytonia these indicators decreased (0.53 ± 0.08 units), and with vagotonia, it reached the minimum values (0.46 ± 0.08 units, $P < 0.05$). The linear velocity of blood flow (LVB) was reduced during ChEM (in the compensated stage to 32.7 ± 2.77 cm/s, on the right, 32.6 ± 3.01 cm/s on the left; in the subcompensated one, 29.2 ± 3.1 cm/s on the right, 29.4 ± 3.12 cm/s on the left) in cases of

functional disorders, vascular tone was in the normal distribution range (37.6 ± 4.87 cm/s on the right), 37.8 ± 4.43 cm/s on the left), in some cases - with a significant scatter characteristic of vessels dystonia (from 29 to 44 cm/s).

Relative to vegetative characteristics - maximum with sympathicotonia (39.1 ± 3.23 cm/s on the right, 39.2 ± 3.71 cm / s on the left); the minimum LVB value in the VA basin was recorded with vagotonia (33.7 ± 2.54 cm/s, 33.6 ± 2.99 cm/s on the left). At the same time, under the conditions of activation of sympathetic influences in autonomic dysfunctions and the compensated stage of ChEM angiospastic phenomena were identified.

The main group of patients received a developed and implemented original method of treating VD in chronic vertebral-basilar insufficiency - "Method of treating cerebral angiodystonias with vestibular dysfunction and cognitive impairment in patients with cervical osteochondrosis" - Patent of Ukraine for invention № 119831 - Bul № 1, 12.08.2019), in which verticalized vestibuloadaptation therapy was used against the background of performing exercises with fixing the gaze, for a month the patients received Gamalate B6 1-2 tab. three times a day, Tebokan 1 tab. twice a day, as well as intranasal electrophoresis of 0.1% Semax solution from the anode, 10-12 procedures once a day. The control group received conventional therapy (n = 20).

After the therapy, the number of dizziness cases decreased by 1.5 times (P <0.05), including systemic - by 70.7%. Headaches effectively stopped in 2 times (P <0.05) or their effectiveness according to visual analogue scale (VAS) decreased to 2-3 points, in addition, the latter were closely correlated with the disappearance of dizziness (P <0.05). At the same time, pain in the neck disappeared or decreased by 1-2 points according to VAS. Complaints of reeling while walking decreased by 48.4%.

The frequency of manifestations and the intensity of autonomic dysfunctions decreased (P <0.05), manifestations of ataxia, orthostatic hypotension, syncopal conditions (P <0.05), improvement of coordinator tests (P <0.05), cognitive deficit, normalized sleep, and so on.

The pronounced "vegetotropicity" of the proposed therapy is confirmed by the normalization of autonomous as paroxysmal (pre-, syncopal conditions, blood pressure lability, panic attacks and other autonomic crises) and permanent symptoms, emotional instability, meteotropy.

The proportion of people with eutonia (from 14.5% to 40.3%, P <0.05) increased, VR normalized (2 times - 25.8%, P <0.05), as well as VAA (25, 8%, P <0.05).

The number of cases of nystagmus decreased (by 61.5%). Installation nystagmus completely disappeared, the manifestations of peripheral and central nystagmus decreased 2-fold, or its frequency and amplitude decreased ($P < 0.05$).

Changes in the mean IIA values towards its normal distribution were recorded (from 2.68 ± 0.3 units to 2.19 ± 0.2 units, $P < 0.05$; in cases of eutonia against a background of functional disorders, the average IIA values approached the values of healthy subjects and amounted to 1.9 ± 0.2 units ($P < 0.05$). At the same time, vagotonia supported the manifestations of VD and prolonged the recovery process. In this case, the average values of IIA reached 2.6 ± 0.12 units.

Significantly increased stability in an upright posture in 59.2% of patients ($P < 0.05$), however, at the subcompensated stage of ischemia in the control group, such changes were not significant ($P > 0.05$).

Manifestations of clinically significant depression and anxiety stopped in 43.7% ($P < 0.05$), and in 44.0% of patients, respectively ($P < 0.05$). In the main group - 1.9 ($P < 0.05$) and 2 times ($P < 0.05$), respectively.

The state of short-term and long-term memory improved, while the maximum indicators were in the main subgroup of SAD ($P < 0.05$), as well as in the compensated stage of ChEM. In the first presentation - on average 0.8 ± 0.5 , in the second - 0.9 ± 0.4 , in the third - 0.9 ± 0.7 , in the deferred - 0.5 ± 0.2 the words. In the control, these indicators did not exceed two tenths ($P > 0.05$).

In the absence of ChEM, the reproduction of words was maximal; in the subcompensated stage of ChEM, it was minimal.

There was a significant improvement in brain perfusion according to the LVB data (Vps) of the main group, this was especially evident with ChEM ($P < 0.05$), as well as in cases of normotonia, which indirectly indicates the sympathicolytic effect of the proposed therapy.

According to the resistance index, the improvement in its average values depended on the degree of ischemic brain damage in cases of its compensation ($P < 0.05$). In addition, RI did not depend on the state of VT, however, the obtained data indicate that autonomic regulation significantly affects the hemodynamics of cerebral circulation, controls the mechanisms of its homeostasis, especially in the vertebral-basilar basin where there is an abundance of anatomical and neurohumoral influences. Thus, it is possible to ascertain the harmonizing and sympathicolytic effects of the proposed therapy with an effect on the main pathogenetic mechanisms of the studied vestibular, vegetative-vascular pathology.

Results

1. The main clinical manifestations of the triggering and / or accompanying pathological mechanisms of vegetative-vascular dysfunctions against the background of degenerative changes in the cervical spine have been identified. First of all, it is dizziness (100.0%) with pronounced vegetative, vascular, painful phenomena, as well as symptoms associated with them.

2. Indicators of the integrative state of statolocomotor correlated with the degree of ischemic damage to the central nervous system, as well as with the state of the suprasegmental department of the autonomic system, psychoemotional sphere and cognitive disorders.

3. The presence of degenerative-dystrophic changes was manifested in the form of instability of the cervical segments of the spine mainly at the level of C5-C4 with angiospastic phenomena in the vertebral arteries against the background of a sympathetic increase in autonomic tone.

4. The proposed complex therapy made it possible to reduce or arrest the main subjective and objective syndromes and symptoms, which can be regarded as justified, affecting the main links in the pathogenesis of vestibular disorders, taking into account the “vegetotropicity”, sympatholytic effect, and improvement of perfusion in the vertebral-basilar pool and brain in whole.

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