MEDICINE

PARKINSON'S DISEASE MEDICAL REHABILITATION METHODS

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Abstract. *Parkinson's disease ranks first among the neurodegenerative pathology. The approach to the treatment of Parkinson's disease must be comprehensive. Medical rehabilitation methods include not only basic drug therapy, surgical methods of treatment, but also methods of physiotherapy, reflexology, physiotherapy, speech therapy and psychotherapy. When prescribing physical factors in patients at different stages of the disease, it is possible to recommend those methods that will have a more pronounced effect on the clinical symptoms of Parkinson's disease. From physical factors, balneotherapy, thermal mud therapy, impulse currents, electrophoresis, electrostatic field, microwave therapy, phototherapy, barotherapy are prescribed. The use of trans cerebral Electrotherapy methods and computer-Stabil graphic programs in complex treatment based on biofeedback by statokinesogram will reduce the severity of the main symptoms of the disease.*
Keywords: *medical rehabilitation, physiotherapy, Parkinson's disease.*

1. Introduction. Parkinson's disease remains a common neurological disorder in the elderly. The frequency of its occurrence ranges from 100 to 250 cases per 100,000 people [1]. Today in economically developed countries, there is an increase in life expectancy and the number of elderly people, which leads to an increase in the number of people with Parkinson's disease.

2. Materials and Methods. The etiology of Parkinson's disease is still unknown. However, it has been suggested that there is a hereditary predisposition to it. At the heart of the disease is a decrease in the number of substantial nigra neurons that produce the inhibitory neurotransmitter dopamine. In addition to the substantial nigra, degenerative changes are also observed in the hypothalamus, reticular formation, peripheral, autonomic system, cerebral cortex and some other structures. There is not only an imbalance in the dopaminergic system, but also in the noradrenergic, cholinergic, serotonergic mediator systems [2].

Psychotrauma can become a triggering external factor. In patients with Parkinson's disease, changes in psychoemotional and cognitive spheres are often observed [3]. The diagnosis of parkinsonism syndrome is made in the presence of hypokinesia, as well as one of the symptoms: muscle rigidity, resting tremor, postural instability not associated with visual, vestibular, cerebellar or proprioceptive dysfunction [4].

In the clinic, the forms of Parkinson's disease are distinguished: trembling, rigid, kinetic - and also "mixed" - according to the predominance of the symptom: tremor-rigid and akinetic-rigid.

Medicinal methods correct the rising imbalance in the dopaminergic, cholinergic and glutamatergic neurotransmitter systems. Prescribe drugs to increase the level of dopamine: dopa-containing drugs (levodopa, etc.), amantadine drugs (midantan, PK-merz), monoamine oxidase B inhibitors (selegiline), catechol-o-methyltransferase (entacapon, tolcapon). They use drugs that stimulate the receptors of the postsynaptic membrane of neurons sensitive to dopamine: dopamine agonists (bromocriptine, pramixol, etc.) And anticholinergic drugs (cycloidal, parkopan, etc.).

Surgical methods are used when the effectiveness of pharmacotherapy decreases, the occurrence of motor fluctuations. These include stereotaxic destructive and stimulation methods. The stereotactic method has a pronounced effect on tremor and rigidity, but does not affect akinesia. Deep brain stimulation is more effective and safer than stereotaxic surgeries. The method reduces the severity of tremor and rigidity, but does not affect gait disturbances.

Physical methods played a significant role in the treatment of Parkinson's disease until the 1960s, before the introduction of L-dopa drugs into medical practice. However, at present, interest in non-drug methods, especially in physiotherapy and exercise therapy, has increased again, since some limitations in the appointment of drug therapy and pronounced side effects of atyparkinsonian drugs have become apparent.

The comprehensive program of rehabilitation measures for Parkinson's disease includes physical factors, exercise therapy, reflexology, psychotherapy, speech therapy, which, when combined, have a positive effect on clinical manifestations. Under the influence of physiotherapeutic factors, hemo- and liquorodynamics improves, the permeability of the blood-brain barrier increases, the level of metabolic processes in the brain and vitality increase.

It is recommended to prescribe balneotherapy to patients with the initial stages of the disease to reduce the severity of clinical symptoms, reduce depressive and anxiety symptoms. If patients have concomitant diseases of the cardiovascular system, hydrogen sulfide baths are used with a hydrogen sulfide concentration of 50-100 mg/l and a temperature of 34-37°C, lasting 8-10 minutes, every other day, for a course of 10 baths. Radon baths are prescribed with a radon concentration of 40 nCi/l (1.5 kBq/l) and a temperature of 36-37°C, lasting 10-15 minutes, every other day, 10-12 baths, if there are concomitant diseases of the musculoskeletal system and peripheral nervous systems. Mineral baths are used with a salt concentration of 20-40 g/l, a temperature of 36°C, a procedure duration of 10 minutes, daily or every other day, for a course of 10-12 procedures in the presence of concomitant pathology of the musculoskeletal system. Iodine-bromine baths are recommended to reduce the depressive and anxious symptoms of the disease with a temperature of 36-37°C, lasting 10-15 minutes, every other day. The course of treatment includes 10 procedures.

When using thermal mud therapy, the excitability of spinal motoneurons decreases, the functional lability of the neuromotor apparatus increases, and the functions of the central nervous system (CNS) are activated. Thermal mud therapy is prescribed to reduce the symptoms of stiffness, hypokinesia and tremors. Apply paraffin wax with a temperature of 46-52°C or ozokerite 50-60°C on the lower thoracic and upper lumbar spine lasting 20 minutes, every other day, 12-15 procedures. Prescribe mud therapy with a temperature of 40-44°C in the form of applications in the same areas, 15-20 minutes, every other day, 12-15 procedures per course [5].

Patients are recommended to electrophoresis of various medications using the "collar" or orbital-occipital techniques, duration 15-20 minutes, daily, 12-15 procedures. The procedures help to improve the tropism of the brain structures, to reduce the severity of the symptoms of the disease. From medications for electrophoresis, a solution of nicotinic (0.5-1%) or ascorbic (2-5%) acid, potassium or sodium iodide (2-5%), noshpa (1-2%), dibazol (0.5-2%), aminophylline (0.5%). Electrophoresis of levodopa is used according to the endonasal or frontal-occipital technique. A solution of the drug is injected from the cathode, daily or every other day. The course is prescribed 10-15 procedures.

Electrosleep procedures are carried out according to the orbital-occipital technique with a frequency of 10 Hz, the exposure time is usually from 15 to 40 minutes, daily or every other day, the course of treatment includes 12 procedures [6]. Electrosleep is prescribed for patients with mixed forms of the disease in the presence of depressive symptoms and cognitive impairments.

The method of mesodiencephalic modulation is used, which is based on the activation of brain structures located in the mesodiencephalic (subcortical) region. The procedures are carried out according to the front-occipital technique (the anode is placed on the forehead, the cathode is in the occipital region) with a pulse frequency of 70-90 Hz, duration of 20 minutes, every day or every other day, 10 procedures per course of treatment.

Sinusoidal modulated currents (CMT therapy) can be recommended after stereotaxic surgery and to reduce rigidity and hypokinesia. CMT-therapy procedures are prescribed paravertebrally on the cervicothoracic and thoracolumbar spine, level CIII — ThI and ThIX — LI, variable mode, type of work - III — IV, frequency 80—30 Hz, modulation depth 50—100%. The exposure is carried out for 5 minutes on each zone, until a feeling of moderate vibration, daily, 20 procedures.

3. Results and discussion. In previous years, medical complexes were developed at the Central Institute of Balneology and Physiotherapy, which included the appointment of UHF-(decimetwave) and CMT-therapy procedures, hydrogen sulfide and radon baths [7]. Complex I consisted of the sequential application of CMT therapy, hydrogen sulfide or radon baths. The purpose of the complex has a significant effect on the severity of the symptoms of parkinsonism. Complex II included UHF-therapy, hydrogen sulfide baths, exercise therapy procedures. UHF-therapy was carried out on the occipital or the collar region from the "Volna-2" apparatus with an exposure power of 20-30 W, lasting 7-10 minutes, 10-12 procedures.

In order to improve microcirculation, reduce muscle rigidity, darsonvalization of the head, collar or paravertebral zone is prescribed. The procedures are carried out with a spark discharge for 5-10 minutes of the total exposure time, daily or every other day, 10-15 procedures.

High, UHF electric field procedures (e. UHF) has a positive effect on the main manifestations of Parkinson's disease. The capacitor plates are positioned bitemporally with an air gap of 3 cm on each side. During the first 5 procedures, the exposure power is 15–20 W, in the rest - 20–30 W. The duration of exposure is 7-15 minutes, with a gradual increase in time by 3 minutes. Treatments are scheduled daily. The course consists of 12 procedures.

The combined method of influence, developed by the Department of Physiotherapy of the Russian Medical Academy of Postgraduate Education, includes the use of e. p. UHF, on the second - the appointment of procedures for electric sleep. The method is used to enhance the influence of physical factors of various nature of the clinical manifestations of this disease. The method of combined exposure is prescribed to patients with mixed forms of the disease, cognitive impairment.

In the method of transcerebral magnetotherapy, a "running" pulsed magnetic field from the A limp apparatus is used, with a pulse frequency of 100 Hz, an intensity of 30% of the magnetic induction in the first 2 procedures, and 100% in the subsequent ones. The procedures are carried out daily, lasting 15 minutes. The course of treatment involves the appointment of 10 procedures. Magnetotherapy has a pronounced effect on depressive-anxiety and cognitive impairments [8].

Ultraviolet irradiation (UFO) has a beneficial effect on the autonomic nervous system, helps to normalize the psychoemotional status of patients. UFO is prescribed for the cervicothoracic, thoracic and lumbar segments along the spine. An erythema dosage is usually used. With the extinction of ultraviolet erythema, follow-up procedures are carried out in 2-3 days 2-3 times a week. The next irradiation is carried out at a dose that exceeds the previous one by 25-50-100%. 3-5 procedures are prescribed for the course of treatment.

Under the influence of light therapy procedures (treatment with bright white light), the main symptoms of parkinsonism are reduced: rigidity, hypokinesia and symptoms of depression. For this, the "Biolamp" apparatus is placed at a distance of 60 cm and at an angle of 45o in the eyes of a sitting patient. The exposure time is 30 minutes. The procedures are carried out in the morning. The course of treatment includes 10 sessions [9].

Hyperbaric oxygen therapy procedures are recommended for patients under the age of 65 and disease duration of 1 to 5 years. Barotherapy helps to normalize the neurotransmitter imbalance of the brain and sympathoadrenal system. In the course of the course of treatment, a gradual increase in pressure is carried out — from 1.6 to 2 am. The procedure takes 40 to 60 minutes. 8-12 procedures are prescribed for the course.

The alternating electrostatic field from the Khivamat apparatus is used in patients with restless legs syndrome, which occurs in the clinical picture of Parkinson's disease and refers to the motor manifestations of the disease. Restless legs syndrome is a condition in which unpleasant, painful sensations develop in the lower extremities, which most often occur at rest in the evening and at night and lead to sleep disturbance. The appointment of an alternating electrostatic field significantly reduces pain and movement disorders, has a positive effect on the emotional sphere, the quality of life of patients. Procedures with a pulse frequency of 85 Hz are prescribed for the muscles of both legs. A handheld applicator is used in the work. The duration of exposure to one limb is 10 minutes, the total time is 20 minutes. 10 procedures are used in the course of treatment.

Massage procedures are carried out with the aim of significantly affecting the neuromuscular apparatus, providing a relaxing effect. Massage of the collar and segmental zones of the spine is prescribed. The course of treatment includes 10-20 procedures. It is necessary to use medication and acupressure massage, avoiding rigid techniques. The massage method is used when the symptoms of rigidity prevail and the presence of distortion in the clinical picture of the disease.

The tasks of exercise therapy as one of the important methods of medical rehabilitation for this category of patients include the maintenance and development of motor stereotypes that help reduce injuries and falls, the prevention of arthropathies that occur when the symptoms of rigidity and hypokinesia increase. In the initial stages of Parkinson's disease, the goals of prescribing exercise therapy procedures are: 1) reduction of the symptom of rigidity; 2) increased range of motion, increased endurance and muscle strength; 3) training in muscle relaxation. In the later stages of Parkinson's disease, the goal of exercise therapy is to reduce the postural instability that occurs in these stages of the disease.

To correct posture disorders, increase stability, reduce falls, computer stabilographic games are used, which are based on the use of visual feedback according to a stabilogram [10]. The computer stabiloanalyzer with biofeedback "Stabilan 01" is used. To improve and consolidate the motor

stereotype, walking skills, a method of tempo-rhythm correction of walking is prescribed, based on the synchronization of the patient's step with individually selected sound stimulation.

Tai chi gymnastics classes have an effective impact. It is based on a complex that includes smooth and slow movements that promote a relaxing effect, reduce rigidity and improve balance.

The speech therapist conducts the correction of speech disorders in patients, in addition, independent exercises are recommended. Patients are encouraged to read poems aloud, repeat phrases from television and radio broadcasters, use dictaphone recordings to correct speech. Reflexology can be recommended for patients with akinetic-rigid and rigid-trembling form of the disease. The effectiveness of the method decreases in the presence of severe tremor. Acupuncture points of the extremities, heads are used, oral acupuncture can be used for speech disorders.

The psychotherapy method includes hypnosis and auto-training. Their use in clinical practice has a sedative effect, a decrease in hypokinesia is noted, but there is no effective effect on resting tremor.

Patients in the early stages of the disease in a resort and the sanatorium are prescribed balneotherapy, Electrotherapy, massage, exercise therapy, walking, swimming, aerobics, sports games (badminton, golf, towns) [7]. It must be remembered that in the early stages of the disease, when the manifestations of the main clinical symptoms of parkinsonism are not pronounced, depressive disorders may be present. Therefore, the complex of rehabilitation measures should include sedative therapy, psychotherapy, auto-training. As the disease progresses and the ability to self-service is preserved, treatment is prescribed in local sanatoriums without changing the climate or in the physiotherapy departments of polyclinics.

To maintain employment, it is recommended to maintain habitual life stereotypes, professional activities, and social contacts. Removing the patient from work can negatively affect his condition. Social adaptation of the patient in the work collective is possible even with the progression of the disease in the conditions of creating a sparing work regime, organizing early medical rehabilitation.

As the disease progresses and the development of a pronounced deficit of motor functions, the patient is released from work, however, it is necessary to maintain and maintain a motor stereotype and self-service skills. To date, medical and social groups for medical examination and rehabilitation and schools for people with Parkinson's disease and their relatives have been organized at the Center of the Ministry of Health of the Russian Federation and its regional branches [2].

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