



Means of occupational therapy in (individual) rehabilitation programs for people with Parkinson's disease

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

The aim of the work is to develop a set of rehabilitation measures including occupational therapy classes for Parkinson's disease and to assess the objective condition of patients on the scales of non-motor symptoms, cognitive and mental disorders.

Materials and methods. The study of patients was conducted on the basis of anamnesis, objective examination and scales for assessment of non-motor symptoms, cognitive and mental disorders (scale of non-motor symptoms – NMSS, scale of mental disorders – MMSE, Montreal scale of cognitive disorders – MOCA); to assess non-motor symptoms, a patient questionnaire was additionally used to identify autonomic disorders (according to A. M. Wayne, 1998). The control and experimental groups were offered exercise, physiotherapy, massage and nutrition (diet). Occupational therapy was added for the experimental group.

Results. After the physical rehabilitation, the condition of the patients significantly improved. The final score in the experimental group of patients with non-motor manifestations of Parkinson's disease on the scale of assessment of non-motor symptoms was statistically significantly lower and was 61.04 ± 0.39 ($P < 0.01$). The final score on the scale of mental disorders was statistically significantly higher – 27.78 ± 0.27 ($P < 0.01$), on the scale of cognitive changes, it also became statistically significantly higher – 25.13 ± 0.19 ($P < 0.01$). According to A. M. Wayne's questionnaire of autonomic disorders, the total score in the control group was 64.0 ± 3.2 . In the experimental group of patients, the total score was 51.0 ± 5.4 points ($P < 0.01$). Thus, under the influence of additional occupational therapy classes, in the experimental group both on the scale of non-motor symptoms and by A. M. Wayne's, questionnaire there was a statistically significant improvement in the condition of patients.

Conclusions. Based on the results of the study, it can be concluded that there is a significant difference ($P < 0.01$) in the condition of patients on the final scores, with the pronounced improvement in the condition of the experimental group patients in comparison with the control group patients, following the results of all survey scales. A significant difference is observed on the scale of non-motor symptoms. A certain role in improving the condition of patients with appropriate screening using study scales and a patient questionnaire to identify autonomic disorders (according to A. M. Wayne, 1998), apparently played a component of the rehabilitation program, which further included occupational therapy classes.

Key words: Parkinson's disease, rehabilitation, occupational therapy, non-motor symptoms, cognitive and mental disorders.

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Застосування ерготерапії у програмі фізичної реабілітації пацієнтів із хворобою Паркінсона

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Мета роботи – розробити комплекс реабілітаційних заходів із включенням занять з ерготерапії при хворобі Паркінсона й оцінити об'єктивний стан пацієнтів за шкалами немоторних симптомів, когнітивних і ментальних порушень.

Матеріали та методи. Стан хворих вивчали за даними анамнезу, об'єктивного обстеження, використали шкали оцінювання немоторних симптомів, когнітивних і ментальних порушень (шкала немоторних симптомів – NMSS, шкала ментальних порушень – MMSE, Монреальська шкала когнітивних розладів – MOCA); для оцінювання немоторних симптомів додатково застосували опитувальник для виявлення вегетативних розладів (за А. М. Вейном, 1998). Контрольній та експериментальній групам запропонували фізичні навантаження (ЛФК), фізіотерапію, масаж, раціональне харчування (дієтотерапія). Експериментальній групі додали ерготерапію.

Результати. Після фізичної реабілітації стан хворих суттєво поліпшився. Підсумковий бал в експериментальній групі хворих із немоторними проявами хвороби Паркінсона за шкалою оцінювання немоторних симптомів був статистично вірогідно нижчим і становив $61,04 \pm 0,39$ ($p < 0,01$). Підсумковий бал за шкалою ментальних порушень став статистично вірогідно вищим – $27,78 \pm 0,27$ ($p < 0,01$), як і за шкалою когнітивних змін – $25,13 \pm 0,19$ ($p < 0,01$). Згідно з опитувальником вегетативних порушень за А. М. Вейном,

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Key words: Parkinson's disease, rehabilitation, occupational therapy, non-motor symptoms, cognitive and mental disorders.

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сумарний бал у контрольній групі становив $64,0 \pm 3,2$, в експериментальній – $51,0 \pm 5,4$ ($p < 0,01$). Отже, під впливом додаткових занять з ерготерапії в експериментальній групі і за шкалою немоторних симптомів, і за опитувальником за А. М. Вейном спостерігали статистично вірогідне поліпшення стану хворих.

Висновки. Виявили вірогідну різницю ($p < 0,01$) стану хворих за підсумковими балами в бік поліпшення між контрольною та експериментальною групами хворих за результатами обстеження за всіма шкалами. Найсуттєвішу різницю спостерігали за шкалою немоторних симптомів. Певну роль у поліпшенні стану хворих за відповідним скринінгом, що виконаний за допомогою шкал досліджень та опитувальника пацієнтів для виявлення вегетативних розладів (за А. М. Вейном, 1998), очевидно, відіграли компоненти реабілітаційної програми, яка додатково включала заняття з ерготерапії.

Ключові слова: хвороба Паркінсона, реабілітація, ерготерапія, немоторні симптоми, когнітивні та ментальні порушення.

Актуальні питання фармацевтичної і медичної науки та практики. 2021. Т. 14, № 3(37). С. 382–389

Применение эрготерапии в программе физической реабилитации пациентов с болезнью Паркинсона

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Цель работы – разработать комплекс реабилитационных мероприятий с включением занятий по эрготерапии при болезни Паркинсона и оценить объективное состояние пациентов по шкалам немоторных симптомов, когнитивных и ментальных нарушений.

Материалы и методы. Состояние больных изучили по данным анамнеза, объективного обследования и шкал оценки немоторных симптомов, когнитивных и ментальных нарушений (шкала немоторных симптомов – NMSS, шкала ментальных нарушений – MMSE, Монреальская шкала когнитивных расстройств – MOCA); для оценки немоторных симптомов дополнительно использовали опросник пациентов для выявления вегетативных расстройств (по А. М. Вейну, 1998). Контрольной и экспериментальной группам назначены физические нагрузки (ЛФК), физиотерапия, массаж и рациональное питание (диетотерапия). Экспериментальной группе добавляли эрготерапию.

Результаты. После физической реабилитации состояние больных значительно улучшилось. Итоговый балл в экспериментальной группе больных с немоторными проявлениями болезни Паркинсона по шкале оценки немоторных симптомов был статистически достоверно ниже и составлял $61,04 \pm 0,39$ ($p < 0,01$). Итоговый балл по шкале ментальных нарушений стал статистически достоверно выше – $27,78 \pm 0,27$ ($p < 0,01$), как и по шкале когнитивных изменений – $25,13 \pm 0,19$ ($p < 0,01$). По опроснику вегетативных нарушений по А. М. Вейну суммарный балл в контрольной группе составил $64,0 \pm 3,2$, в экспериментальной – $51,0 \pm 5,4$ балла ($p < 0,01$). Таким образом, под влиянием дополнительных занятий по эрготерапии в экспериментальной группе и по шкале немоторных симптомов, и по опроснику по А. М. Вейну наблюдали статистически достоверное улучшение состояния больных.

Выводы. Отмечена достоверная разница ($p < 0,01$) состояния больных по итоговым баллам в сторону улучшения между контрольной и экспериментальной группами больных по результатам обследования по всем шкалам. Значимая разница установлена по шкале немоторных симптомов. Определённую роль в улучшении состояния больных по соответствующему скринингу, выполненному с использованием шкал исследований и опросника пациентов для выявления вегетативных расстройств (по А. М. Вейну, 1998), очевидно, сыграли компоненты реабилитационной программы, которая дополнительно включала занятия по эрготерапии.

Ключевые слова: болезнь Паркинсона, реабилитация, эрготерапия, немоторные симптомы, когнитивные и ментальные нарушения.

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Parkinson's disease (PD) is one of the most common neurological diseases after Alzheimer's disease. According to the WHO, the incidence of PD is from 60 to 187 cases per 100.000 of population. In Ukraine, about 133 cases of PD per 100 thousand of population are registered. Despite the fact that the disease is steadily progressing and today there are no means to stop the neurodegenerative process, the rational use of existing approaches to treatment allows to maintain adequate physical activity of patients, enabling them and their families to maintain a normal lifestyle for many years [3,4]. Methods of physical rehabilitation occupy an important place in the complex PD treatment. Its main tasks in patients with PD are as follows: to prevent or reduce the growth rate of pathological symptoms and to adapt patients to existing functional disorders [4]. Physical rehabilitation for Parkinson's disease should be comprehensive, with special emphasis on exercise therapy and massage, as well as mandatory consideration of the patient's age, general physical condition, the presence of comorbidities and stage of the disease.

Aim

The aim of the work is to develop a set of rehabilitation measures including occupational therapy classes for Parkinson's disease and to assess the objective condition of patients on the scales of non-motor symptoms, cognitive and mental disorders.

Materials and methods

Research methods include the following: the study of patients conducted according to the anamnesis, objective examination and scales for assessment of non-motor symptoms, cognitive and mental disorders (scale of non-motor symptoms – NMSS, scale of mental disorders – MMSE, Montreal scale of cognitive disorders – MOCA); to assess non-motor symptoms, a questionnaire of patients for the detection of autonomic disorders (according to A. M. Wayne, 1998) was additionally used. In the course of the research, a sample of scales and tests used in Ukraine, European and American countries in the process of cognitive level diagnosis was made. These include a

brief examination of cognitive functions (Mini-Mental State Examination – MMSE), Montreal Cognitive Assessment (Montreal Cognitive Assessment – MOCA). In a detailed analysis, the above examination tools were evaluated for the following properties: availability, objectivity, and specificity for determining the cognitive level in patients with PD.

Mini-mental State Examination (MMSE) test comprises 30 questions for an approximate assessment of the state of cognitive functions – orientation in time, place, perception, memory, speech, performance of a three-stage task, reading, drawing. This test is universal for use in neurology and gives quite objective results.

The Montreal Cognitive Assessment (MOCA) is a short 30-question test that takes about 10–12 minutes. The advantages of this test are brevity, simplicity and accessibility for free use. It is also widely used in neurorehabilitation due to its use in various pathologies (Alzheimer’s disease, post-stroke patients, people with trauma and PD).

To assess non-motor symptoms, a patient questionnaire was additionally used to detect autonomic disorders (according to A. M. Wayne, 1998). The questionnaire included the following questions: tendency to redness or pallor of the face with any agitation; numbness or coldness of the fingers, toes; whether there is a change in color of the fingers, feet; feeling of palpitations, “fading”, “stopping” of the heart; increased sweating (constant or agitated); feeling short of breath (shortness of breath, rapid breathing); dysfunction of the digestive system (predisposition to constipation, diarrhea, bloating, pain); feeling sick (dizziness or fainting); headache attacks (diffuse headache, or “half” of the head, “whole head”, squeezing or throbbing pain); reduced efficiency, fatigue; sleep disturbances, difficulty falling asleep, shallow sleep with frequent awakenings, feeling of “lack of sleep”, fatigue when waking up in the morning. These have to be filled in by the patients themselves. The sum of scores exceeding 15 indicated the presence of PD [5].

The research was conducted on the basis of the hospital No. 1 of Kremenchuk. During the experiment, the study involved 20 patients with Parkinson’s disease. In order to determine the impact of the rehabilitation program on recovery, psychological condition, patients were divided into two groups. The control group consisted of 10 people, the experimental group was formed of also 10 people – women and men aged from 60 to 70 years. During the experiment, participants were in the second stage of Parkinson’s disease. The control and experimental groups were offered exercise, physiotherapy, massage and nutrition (diet). The experimental group was additionally prescribed with occupational therapy. The methods of physical rehabilitation used during the experiment involve only biomechanical effects, always individually oriented, and have no age-related contraindications (Table 1).

Exercise therapy is now the simplest and, at the same time, effective method of overcoming Parkinson’s syndrome, as it improves the functioning of the motor, respiratory, digestive and cardiovascular systems. In addition, exercise therapy has a significant positive effect on the psycho-emotional state of the patient, reduces anxiety and the likelihood of depression.

Table 1. General content of the physical rehabilitation program for the patients with Parkinson’s disease

Means of physical rehabilitation	CG	EG	Number of times of application, duration
Exercises: – exercises with active movements; – muscle stretching exercises; – counteraction exercises	+	+	20 min, 1 time a day
Therapeutic massage	+	+	10 min, 1–2 times a day
Physiotherapy: – magnetic therapy; – ultrasound therapy; – electrosleep	+	+	Once a day, individual dosage as prescribed by the doctor
Diet therapy	+	+	Individually, as prescribed by the doctor
Ergotherapy	-	+	20 min, 2–3 times a day

Objectives of exercise therapy in Parkinson’s disease are reducing functional limitations due to rigidity, slow movements and postural changes; maintaining or increasing the range of motion, which prevents contractures and deformations; improving balance, gait and coordination; preventing falling; promoting self-service. In general, there is an increase in patients’ daily activity. Dosed exercise has been shown to improve metabolism, reduce stress and activate cerebral blood flow [12].

The complex of motor rehabilitation in Parkinson’s disease included exercises with active movements, exercises for stretching muscles, counteracting exercises (for muscle relaxation, increasing the amplitude of movements and reducing pain). Breathing exercises are a necessary condition for exercise PD therapy in order to prevent and reduce congestion in the lungs against the background of general hypokinesia. Among the training options were used for the studied patients with second stage of the disease, walking was particularly productive – on a flat place, on different surfaces with different pace and stride length, at an angle and passing through bottlenecks, in a crowd of people [9]. To correct walking, aerobic training on a treadmill or exercise bike was used, as well as “Scandinavian walking”, aerobic exercises, various types of walking, reducing falls and stiffness.

Exercise complexes included the following activities:

1. Deep breathing. Aim: to achieve deeper breathing. In a sitting position, hands on stomach. A slow deep breath is taken through the nose, the chest expands and the abdomen “inflates”. Then slowly, counting to 5, exhale through your mouth (as if blowing candles). Repeat 10 times. In a standing position. Approach the wall. Stand so that the whole back and waist is pressed to the wall or other vertical surface: cabinet, door, etc. Raise your hands up and, touching the wall with them, take a deep breath; when exhaling, lower your arms down and cross them in front of your chest and abdomen so that the your right hand touches your left elbow and vice versa. Repeat 10 times.

2. Exercise for posture. Aim: to learn to regulate the tension of the muscles of the neck and torso to counteract

the formation of a “stooped posture”. Stand with your back to the wall so that the back of the head, shoulders, buttocks, thighs and legs touch the wall; the hands should be placed along the body, the palms rest against the wall. With the tension “squeeze” into the wall (count to 5), and then relax and unwind; repeat up to 5 times and return to starting position. Remaining “stuck” to the wall with the back of the head, back, buttocks and palms, sit squatting “sliding” back on the wall. If it is difficult to get up later, put a chair or a stick next to you. Stand facing the wall so that one cheek, turned to the side, chest, abdomen, and thighs “stuck” to the wall. Spread your arms at shoulder level and position them so that your palms “stick” to the wall. Raise your palms above your head. When the palms are above the head – exhale, when they return to shoulder level – inhale. Perform until exhaustion.

3. “Twisting the torso”. Aim to improve the mobility of the muscles of the neck, shoulders, and torso. In a sitting or standing position, place your palms on your shoulders or neck. Rotate the head, neck and torso first to one side and then to the other as much as possible. There should be a slight tension in the muscles of the torso. Repeat 10 times.

4. Bending of the torso. Purpose: to improve posture and improve mobility in the thoracic and lumbar spine. Sitting on a chair, put your palms on your knees, lean forward, then bend your back in an arc, straighten your shoulders. Then sit up straight. Repeat 10 times. Sitting on a chair, place your hands on your waist (take yourself by the waist). Bend at the waist, protruding chest forward and straighten shoulders, counting to 20 times. Then sit up straight. Repeat 10 times.

5. Push-ups. Aim: to stretch the shoulder muscles and improve posture. Stand facing the corner of the room. Rest your hands on both walls and bend to the corner, bending your arms at the elbows so that you can feel the muscle tension. When performing a tilt, do not take your feet off the floor. Leaning down to continue to rest his hands on the walls for 20 seconds. Then return to starting position. Repeat 10 times.

6. Circular movements and inclinations of the torso. Aim: To improve the mobility of the torso muscles. Starting position standing, feet shoulder-width apart, arms at waist. Perform circular movements of the torso (how to rotate the hoop), as well as tilts forward, backward, sideways. Repeat 10 times in each direction.

7. Exercises for the muscles of the neck and upper arms Turns the head to the side. Purpose: to improve mobility in the cervical spine. In a sitting or standing position, slowly turn your head from side to side, trying to look over your shoulder when turning. Turning your head, hold it in this position for up to 5 seconds. There should be a slight tension in the muscles of the neck. Repeat 10 times. Slowly tilt your head to the side, alternately to each shoulder. When leaning, try not to turn your head, look ahead. There should be a slight tension in the neck muscles with each tilt. Perform 10 inclines in each direction. In a sitting or standing position. Unbend your neck and push your chin forward. Then return to starting position. Repeat 10 times. Lower your head and touch your chin to your chest, return your head to its original position. Repeat 10 times.

8. Exercises for shoulder girdle muscles. Aim: To achieve tension training and relaxation of the muscles of the upper shoulder girdle. In a sitting or standing position, join hands with palms together. Tighten your arms, that there is strength so that the palms rest against each other. Count to 20. Repeat 5–10 times. In a sitting or standing position, bend your arms at the elbows and bring your elbows back, bringing the shoulder blades closer together. Keep them in this position, counting to five. Repeat 10 times. In a sitting or standing position, make circular movements with the shoulders (the shoulder moves up, back, down and forward). Perform together or alternately with each shoulder up to 5 times. Then repeat the circular motions in the opposite direction (down, forward, up, back).

9. Exercise for hands. Aim: To improve mobility in the elbow and wrist joints. In a sitting position, put your hands on your thighs, palms down. Then turn your hands palms up. Start these alternating movements at a slow pace, then gradually increase the pace of movements. In a sitting position, slowly perform circular rotations of the hand of one hand in the radial wrist joint. Perform five turns in each direction. Then perform circular rotations of the brush of the other hand. If necessary, to facilitate the movements of the brush of one hand, you can fix this forearm with the other hand. In a sitting or standing position, alternately touch the thumb to 2, 3, 4 and 5 fingers. Continue the exercise, trying to increase the pace of movement.

Features of therapeutic massage in Parkinson's disease. Massage is recommended daily. In complex therapy it gives an excellent result. Stroking, warm-up and rubbing are the most common massage techniques for parkinsonism. Weak shock techniques and vibration are also possible [10]. Massage is performed on the following areas: lower back; pelvic area; lower extremities; abdominal area.

Massage of the lower back: stroking (in the direction from the pelvic area to the lower corners of the shoulders): a) straight; b) alternating; c) spiral; squeezing (in the same direction): a) palm; b) transverse; kneading (on the long muscles of the back): a) circular pad of the thumb; b) pads of four fingers; c) the edge of the thumb; d) “pinch”; e) palm with rolling; rubbing (on the lumbar region): a) rectilinear pad and the mound of the thumb; b) circular pads of fingers; c) the radial side of the brush; d) circular palm; e) sawing; f) intersection; rubbing (along the spine from the sacrum to the lower corners of the shoulder blades): a) rectilinear pads of the 2–3rd fingers; b) rubbing on the intercostal processes; c) circular cushion of the 2nd finger; d) circular pad of the third finger [3,6].

Massage of the pelvic area on the gluteal muscles: stroking: a) straight, b) alternating; squeezing; kneading: a) ordinary; b) double ring; c) circular with both fists; d) circular.

Massage of the lower extremities. It is performed first on the back surface in the following sequence: thigh, calf muscle, sole.

Abdominal massage: stroking (palm surface of the hand clockwise); horseshoe squeezing; kneading on the rectus abdominis: a) ordinary; b) double ring; c) combined; d) phalanges of bent fingers; stroking; massaging the solar plexus.

A total of 12–14 sessions were held (daily or every other day).

Physiotherapy allows you to activate metabolic processes, improve blood circulation. In complex rehabilitation together with exercise therapy, massage, physiotherapy techniques have a positive effect on the central, peripheral and autonomic nervous system, musculoskeletal system. The following methods of physiotherapy were used: magnetic therapy; ultrasound; electrosleep; magnetic therapy.

Magnetic therapy. A permanent magnetic field is used as a sedative, excessive tonus reliever, immunostimulant; alternating magnetic field of high or low frequency radiation can relieve pain, reduce edema, reduce the intensity of inflammation; the impulse effect tones muscles and stimulates the heart. The BTL-5000 magnetic therapy device was used for magnetic therapy. The BTL-5000 combines 2 types of therapy: electrotherapy and magnetic therapy, which are controlled independently of each other and according to the indications can be used in combination. The length and the regimen of the procedure are assigned individually, depending on the characteristics of the patient and the disease. During the procedure, blood pressure is significantly reduced, but after 4–5 sessions the body adapts.

Ultrasound therapy. Causes compression and stretching of tissues, thereby stimulating the recovery process. Due to the acoustic pressure, micro-vibrations of the tissues are created and the areas that cannot be reached manually are massaged. The treatment course often consists of 5–6 procedures. One treatment is about 15 minutes long. Its effects include the improvement of metabolic processes in tissues; an increase in the production of collagen and elastin; oxygen saturation of cells; normalization of blood circulation; relief to pain and cramps.

Electrosleep. The mechanism of action of this method means direct and reflex effects of current pulses on the cerebral cortex. This procedure stimulates hematopoiesis in the human body, normalizes blood clotting, activates the function of the gastrointestinal tract, improves the excretory and reproductive system, and helps to lower blood cholesterol.

Diet therapy. Parkinson's disease adversely affects the digestive functions of the body. Patients with this disease often experience a decrease in taste, smell, appetite, depressed mood. They suffer from nausea, constipation, weight loss. The basis of the daily diet for Parkinson's disease should include grains and cereals, enough vegetables and fruits, foods rich in calcium and a small amount of protein-rich foods.

The daily human energy requirement is 25–30 kcal per 1 kg of body weight. When calculating calories in patients with Parkinson's disease, it is taken into account that violent movements such as tremor, as well as spastic manifestations consume about as many calories as moderate exercise [4]. The ratio of carbohydrates and proteins should be at least 4–5:1. The recommended daily dose of protein averages 0.8 g per 1 kg of body weight [9]. With Parkinson's disease, it is not recommended to starve; eat a lot of salt (6 grams per day is recommended, it is better to salt food at the end of cooking); fast food, a lot of sweets (carbohydrates abuse is dangerous

to health), snacks (they contain a lot of dyes); alcohol, soft drinks. One should eat 5–6 meals – 3 main meals and 2 additional a day. There is no special diet for Parkinson's disease.

However, the role of proper nutrition in this disease is very important. Food should be varied, rich in B vitamins (B1, B2, B6, B12, folic acid), which are involved in the regulation of metabolism in nervous tissue, including increasing dopamine levels. B12 and folic acid also reduce the amount of the amino acid homocysteine (it is believed that it is involved in the pathogenesis of the disease). These vitamins intake has a positive effect on the mood of patients and reduces depression.

Among the recommended products for Parkinson's disease, B1 is found in potatoes, oatmeal, buckwheat, nuts, carrots, spinach. Suppliers of B2 are eggs, cabbage, dairy products, rosehip. B6 is obtained from cereals, meat, fish, bananas, potatoes, berries. Sources of B12 are fish, soy, sea kale. Folic acid (B9) is found in dark green vegetables (spinach, asparagus, lettuce), avocados, beans, less in egg yolks. Patients are also recommended products containing vitamins C, E, A (antioxidants): fruits and berries; especially bright colors: red, yellow, black (blueberries, strawberries, raspberries, black currants, red peppers, beets, carrots, etc.). Vitamin E is abundant in unrefined vegetable oils, egg yolks. Patients should receive fruits, vegetables, greens, potatoes, nuts, various seeds. Legumes are recommended in the early stages of the disease. White meat (turkey, rabbit, chicken) is recommended.

Parkinson's disease has a profound effect on motor activity and muscle function. Therefore, patients may have problems with eating itself – it may be difficult to hold a spoon, swallow, chew pieces. To facilitate the process, doctors recommend following these rules: eat small portions at least 5–6 times a day, eat only sitting up straight, and when swallowing lean forward slightly; no rush, chewing slowly, no mouth clogging, eating liquid food. For convenience, you can drink through a straw, it is important not to take large sips, so as not to splutter. It is best to use a spoon. If it is difficult to hold in hands, one can wrap the handle with any convenient tape. This will make it wider and it will be easier to grab the spoon. For any dishes, deep wide plates are preferable so that the food does not spill. The table surface should not be gliding so that objects do not move or fall to the floor due to involuntary movement. The easiest way is to lay a thick textile tablecloth or put the dishes on a special rubberized or bamboo mat.

Ergotherapy. Daily therapy, or ergotherapy, is a type of rehabilitation treatment aimed at restoring those functions that are necessary for daily activities. First of all, attention is paid to the functioning of the upper extremities [8]. The purpose of rehabilitation treatment is to ensure the independence of a person in his daily life, to make their home environment comfortable and safe, where everything is at hand, with the help of special tools. Parkinson's disease significantly complicates self-care (dressing, washing, eating, taking a bath, using the toilet) and interferes with daily activities both around the house (cleaning, cooking and other household chores) and outside the home (e.g. shopping). However, with the help of various techniques and aids you can adapt to your illness; you can become less dependent on its symptoms by

Table 2. The condition of patients of different groups on the scales for assessing their condition (M ± m)

Groups of patients	NMSS	MMSE	MOCA
Control (n = 10)	71.13 ± 0.32	25.52 ± 0.30	22.16 ± 0.23
Experimental (n = 10)	61.04 ± 0.39*	27.78 ± 0.27*	25.13 ± 0.19*

*: significant ($P < 0.01$) difference between groups.

Table 3. Comparative assessment of patients in the control and experimental groups

Questionnaire	Control group	Experimental group	Certainty
Wayne's questionnaire	64.0 ± 3.2 point	51.0 ± 5.4 point	$P < 0.01$

learning to cope with daily activities. Both individual and group activities are used in rehabilitation treatment. Creative activities help to improve the emotional state, as well as improve hand function and fine motor skills.

The occupational therapy program included the following: self-care training; using the toilet (the toilet should be high and have handrails on both sides); washing (to avoid slipping, the floor covering in the bathroom should be rough; movement should be facilitated by handrails on the walls; a chair should be put in the shower to avoid falls); eating (cutlery with thickened handles, mounts for steadying plates); dressing (activities that require fine motor skills such as fastening and unbuttoning buttons and hooks, tying and untying laces; putting on socks and shoes); sitting position; suitable clothing; improvised means; changing position (the bed or chair should have the appropriate height). As for the household chores and other activities, small items must have thickened handles; work tools must have long handles; work surfaces should be high enough. Rehabilitation procedures should be started in the early stages of the disease to better adapt to the disease and live the most active life [1–10].

After the physical rehabilitation, the condition of the patients significantly improved. Cognitive, mental functions, motor abilities and manifestations of the cardiovascular system have been effectively improved through exercise and the whole complex of developed physical therapy. In patients, there was a significant improvement in thinking, memory or decision-making, recovery of motor skills. In the majority of patients, some of the symptoms disappeared, and in the rest, myalgia and arthralgia became less pronounced, thinking and mood improved, and blood pressure returned to normal [11–15].

Changes in the condition of patients after physical therapy for the better were registered according to both subjective and objective survey data. The data on the scales for assessing the condition of patients with non-motor manifestations of Parkinson's disease were particularly significant. They showed a significant difference between the control and experimental groups of patients. As can be seen in *Table 2*, the final score in the control group of patients on the scale of assessment of non-motor symptoms was 71.13 ± 0.32 , on the scale of mental disorders – 25.52 ± 0.30 , on the scale of cognitive changes – 22.16 ± 0.23 points.

The final score in the experimental group of patients with non-motor manifestations of Parkinson's disease on the scale of assessment of non-motor symptoms was statistically

significantly lower and was 61.04 ± 0.39 ($P < 0.01$). The final score on the scale of mental disorders was statistically significantly higher – 27.78 ± 0.27 ($P < 0.01$), on the scale of cognitive changes, it also became statistically significantly higher – 25.13 ± 0.19 ($P < 0.01$).

To assess non-motor symptoms, a patient questionnaire was additionally used to detect autonomic disorders (according to A. M. Wayne, 1998) (*Table 3*).

According to Wayne's questionnaire of autonomic disorders, the total score in the control group was 64.0 ± 3.2 . In the experimental group of patients, the total score was 51.0 ± 5.4 points ($P < 0.01$).

Results

In the experimental group of patients, according to both the scale of non-motor symptoms and Wayne's questionnaire, there was a statistically significant improvement in patients. The final score in the experimental group of patients with non-motor manifestations of Parkinson's disease on the scale of non-motor symptoms was statistically significantly lower and was 61.04 ± 0.39 ($P < 0.01$) (in the control group, it was 71.13 ± 0.32). The final score on the scale of mental disorders was statistically significantly higher – 27.78 ± 0.27 ($P < 0.01$) (in the control group, it was 25.52 ± 0.30), on the scale of cognitive changes, it also became statistically significantly higher – 25.13 ± 0.19 ($P < 0.01$) (in the control group, it was 22.16 ± 0.23).

Discussion

Significant improvement in the condition of patients in the experimental group by appropriate screening with scales of research and interviewing patients to identify autonomic disorders (according to A. M. Wayne, 1998) contributed to the components of the rehabilitation program, which further included classes with elements of occupational therapy. Parkinson's disease significantly complicates self-care and interferes with daily activities both at home and outside. The use of elements of occupational therapy is aimed at restoring those functions that are necessary for daily activities

Conclusions

1. Before developing a rehabilitation program, a survey of motor functions and non-motor symptoms was performed

in patients with Parkinson's disease. There were various disorders: from a slight decrease in memory to more serious problems with attention, thinking and memory, concentration. From the cardiovascular system, patients complained of a feeling of increased heart rate, fading, cardiac arrest, high blood pressure and its fluctuations, sweating, difficulty breathing, shortness of breath, fainting in a stuffy room. In some patients, non-motor signs of PD were manifested by moderate cognitive impairment. Only a few have had elements of dementia that indicate that PD is beginning to affect areas of their brain that control attention, thinking, and memory. Hallucinations, mainly visual, were recorded in some patients. They could "see" animals or people who were not really around them. At first, most people admitted that hallucinations were not real to them.

Thus, the identified motor disorders and non-motor symptoms were taken into account when prescribing means and methods of physical rehabilitation for the correction of motor disorders.

2. Regular rehabilitation interventions slow down the progression of the disease. Therefore, immediately after the examination and diagnosis, exercise, occupational therapy, and diet are required. The main goal of physical therapy for Parkinson's disease is to relax muscles and joints, reduce muscle atrophy caused by impaired mobility. Exercise should stretch the shortened muscles and increase the mobility of the joints, improve coordination of movements, posture, and increase stride while walking. In addition, physical rehabilitation improves breathing, strengthens the voice and makes speech more expressive. Exercises should cover all muscle groups and movements in all joints to ensure maximum range of motion. Each session trains a specific muscle group but most of these exercises should focus on training those movements that help to overcome the motor disorders caused by the disease. Any motor exercises are easier to perform in a rhythmic mode which is familiar or pleasant to the patient: this can be either rhythmic melodies or simple calculation, both aloud and "mentally". At Parkinson's disease, it is necessary to do massage as the patient loses the ability to move freely. Massage helps to restore muscle mobility, but it is especially important that it has a positive effect on the CNS. With parkinsonism, it is desirable to massage daily or at least every other day. In complex therapy, it gives an excellent result.

The general program of physical rehabilitation for the studied groups included exercise therapy, physiotherapy, nutrition and massage. The control and experimental groups were offered exercise, physiotherapy, massage and nutrition. Some elements of occupational therapy were added to the experimental group. The methods of physical rehabilitation used during the experiment involve only biomechanical effects, always individually oriented; they have no age-related contraindications.

3. Based on the results of the study, it can be concluded that there is a significant difference ($P < 0.01$) in the condition of patients on the final scores, with the pronounced improvement in the condition of the experimental group

patients in comparison with the control group patients, following the results of all survey scales. The most significant difference is observed on the scale of non-motor symptoms. Components of the applied rehabilitation program, which additionally included occupational therapy classes, obviously played a role in improving the patients' condition by appropriate screening with the help of research scales and a questionnaire of patients for the detection of autonomic disorders (according to A. M. Wayne, 1998). The implementation of rehabilitation measures for non-motor PD manifestations had sufficient theoretical and practical justification, which was confirmed by relevant studies, and probably revealed the impact of rehabilitation on the processes of neuroplasticity of patients with PD – synaptogenesis, neurogenesis, neuronal sprinting, increased stimulators of neurotransmitters. The improvement of patients, lower blood pressure and some normalization of lipid homeostasis, undoubtedly occurred under the influence of the developed comprehensive physical rehabilitation.

4. The data obtained during the analysis of research results testify to the effectiveness of the complex physical rehabilitation of motor disorders and non-motor manifestations of Parkinson's disease developed and used in the therapeutic process, and allow to recommend it for wider implementation.

Prospects for further research. In the future, the clinic plans to develop a physical rehabilitation program for Parkinson's disease using aquatherapy.

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