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## **Różne formy terapii ruchem stosowane w rehabilitacji choroby Parkinsona**

### **Different forms movement therapy used in rehabilitation of Parkinson's disease**

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#### **Streszczenie**

Przyczyny choroby Parkinsona (PD) nie zostały zdefiniowane, co stanowi poważny problem zarówno w aspekcie medycznym, jak i społecznym. Problem może wynikać z faktu, że nie opracowano farmakoterapii, która zapewniłaby całkowite lub częściowe wyleczenie chorego. Istotną rolę w redukcji postępujących objawów chorobowych odgrywają nefarmakologiczne formy leczenia. Poza standardową kinezyterapią, duże znaczenie terapeutyczne odgrywają: choreoterapia, muzykoterapia, masaż, terapia mowy oraz fizykoterapia. Zastosowanie w/w metod pozytywnie wpływa na ogólny stan sprawności fizycznej pacjenta, ponadto przyczynia się do opóźnienia rozwoju charakterystycznych objawów choroby Parkinsona takich jak: sztywność mięśniowa, drżenie i spowolnienie ruchowe. Różnorodność wprowadzanych interwencji wpływa nie tylko na poprawę stanu czynnościowego pacjenta, ale także przyczynia się do wzrostu samooceny i samopoczucia psychicznego.

## **Abstract**

The causes of Parkinson's disease have not yet been strictly defined, which is why it is a serious social problem nowadays. The problem stems mainly from the fact that pharmacological methods have not been developed to such an extent to completely cure the disease. Due to the application of those methods, it is primarily expected to cause the delay in the development of disease symptoms. An important role in the reduction of progressive disease symptoms is performed by non-pharmacological forms of rehabilitation. In addition to standard kinesitherapy, the following are of great therapeutic importance: choreotherapy, music therapy, massage, physical therapy, and balneotherapy. The use of these methods positively affects the general state of physical fitness of the patient, moreover, it contributes to the delay in the development of characteristic symptoms of Parkinson's disease such as muscle stiffness, tremor, and slowness of movement. The variety of implemented interventions not only improves the patient's functional status but also contributes to the increase of self-esteem and psychological well-being.

**Słowa kluczowe: zespół Parkinsona, fizjoterapia**

**Key words: Parkinson syndrome, physiotherapy**

## **Admission**

Parkinson's disease directly results from the malfunctioning of the extrapyramidal system. The occurrence of typical symptoms, such as muscle rigidity, slowness of movement (bradykinesia), tremor, slurred speech, balance, walking, autonomic and mental associated with degeneration of the central nervous system and located in an area of the basal ganglia and substantia nigra. Dysfunction of this system reduces the level of dopamine and symptoms of the disease become apparent when degeneration is at least 50% of the cells of the substantia nigra.

Knowing the characteristics of the typical symptoms of Parkinson's disease, you can implement the proper rehabilitation program. One of the standard symptoms is slowness of movement, which manifests itself when performing voluntary movements, which include: changing the alignment of the body, initiating a particular motion, move,

and perform daily activities. Bradykinesia not only purposeful movements but also those that are unconscious. In such a situation, disorder, referred to as the depletion of the locomotive, in the alternation of upper limb movements during walking, facial expressions, or eye blinking. Another important symptom is stiffness, which is the unrelenting and reflex increase in muscle tone that occurs both in the extensor muscles and flexor. Stiffness characteristic is encountered during stretching a particular muscle group resistance, a symptom called "lead pipe". Impact on patient mobility also has a tremor. It is defined as uncoordinated and involuntary muscle spasms all over the body, which have been called involuntary movements, impossible to master yourself. The above-mentioned symptoms make up solid gait disturbance such as reducing the length of steps, as a result of not taking your feet up from the ground and their spacing on a broad basis. In addition, the patient does not teeter alternating upper limbs and gait speed drastically decreases. Another problem is the change in direction of movement. In the course of the disease characterized by episodic also gait pathologies, called *zastygnięciami*. They appear in a situation resulting in delayed initiation of gait initiation of the operation, the patient puts the very short steps, called trotting. In addition, episodes freezes occur when you try to move a patient through a door or a change of direction gait. Specific use in reducing the symptoms of these demonstrations have found: music therapy, speech therapy, choreotherapy, massage, physiotherapy and physical therapy. Knowledge of symptoms allows the utilization of optimal methods, based on a targeted treatment [1-3].

### **Music Therapy**

Music therapy is a form of teaching including choreotherapy, playing various instruments, singing, listening to the sounds and melodies, and other attractive types of motor activity with the participation of music. During rehabilitation, gymnastic equipment is used, for example, mattresses, balls, gymnastic benches and instruments and tape recorders. A key role in streamlining through music plays rhythm, which includes: the tempo, time signature, and determined the amount of modulated sounds. Music is the formula to which the patient is adjusted to perform certain specific movement sequences. Through music therapy with Parkinson's disease effective use of external stimuli, engaging with their help, undamaged by disease, the structure of pyramidal tract. Focus and concentration on the rhythm of the music make it easy to perform movements and improves their liquidity. Important role acknowledges the

music therapy to combat akinesia, hypokinesia, and offsetting the number of movement freezes during use. Music also affects the quality of gait, improving the speed and stride length. An important aspect of the speech therapy exercises, so patients are recommended sings, preferably affecting articulation sounds, the emphasis words and the regulation of respiration. This kind of exercise is very important because the development of the disease leads to abnormalities of the speech apparatus such as dysarthria or hypophonia. In addition, a patient participating in therapy with the help of music and playing instruments, improve the quality of well-being mental. Emotions are alleviated, the body relaxes and mutes, and this, in turn, prevents depressive states [4, 5].

### **Choreotherapy**

In addition to music therapy, another attractive form of physical activity is dancing. Streamlining through dance is one of the alternative forms of rehabilitation and a lot of interest among scientists. The purpose of this kind of therapy is not to focus on the implementation of individual, schematic issues and conducting classes, controlling the way of moving. This form of rehabilitation for complete improvisation while dancing and networking with co-participants, as well as alleviating symptoms and improving quality of life. Dance therapy is of great importance in improving patients because of a positive impact on both the physical realm, as well as mental. The rehabilitation by means of dance music plays a central role and rhythm. Most often used in the classroom cheerful and rhythmic music, the aim of which is to motivate to perform the motor activity, and peaceful music, relaxation plays a role in reducing muscle stiffness. The choreotherapy beneficial effect is noticeable in aspects such as: facilitating the initiation of movement and improving the speed of their execution because of the imposed tempo of the music, which in turn had found use in the fight against bradykinesia. Implementation of the dance brings many other effective effects such as improving body balance, posture correction achieved through the dance performed during the rotational movement of the trunk and shoulder and pelvic girdle, increase muscle flexibility and joint mobility, simulation proprioceptive system, improve the quality and efficiency of gait, by extending the length of steps and improving the liquidity of movements. When the patient exercises alternating dance weight to the lower limbs than the center line of the body through the swing frequently

changes direction, it performs rotation moves at different speeds, placing steps for in homogeneous length. All the above-mentioned activities provide comprehensive patient training, containing all the necessary aspects to which attention should be paid to the improvement in Parkinson's disease. Dance therapy is more beneficial than the standard rehabilitation because a patient does not teach the principles, techniques, and sequences of movements, but allows him to complete improvisation and self-reliance. This form of physical activity improves mood and enhances the motivation to exercise, increases self-esteem, work antidepressants, and also enhances the effectiveness of rehabilitation programs carried out [6-8].

### **speech therapy**

One of the primary symptoms of Parkinson's disease, worsening significantly the quality of life, in particular, communicate with others, they are slurred speech. In Parkinson's disease, they have received titer dysarthria or dysarthrophonia. These symptoms are not due to poor vocabulary, but the way in which a patient pronounces. The most frequent disorders are the incorrect articulation of sounds, sufficient voting power (hipofonia) and changes in voice intonation and melody leading to prosody. The most common cause of irregularities in the way the camera is inadequate muscle function buccal-facial and throat muscles. The difficulty is also a decrease in vital capacity. The impact on voice quality is also accompanying the patient bradykinesia, which affects the slowing of speech. In some cases, there is trembling voice, caused by trembling muscles involved in the process of breathing and the soft palate. The rehabilitation program should be implemented in strict sequence. Improvement begins by introducing exercise loosening, then apply the respiratory training, so that in subsequent stages of the exercise start speech therapy and articulation. A significant problem is the muscle stiffness, which has a considerable ability to speak on, so before exercise, proper consideration should be given training aimed at relaxing the muscles of the whole body. Relaxation exercises should be performed with the use of background music. The adoption of appropriate position ensures proper exercise technique and the expected relaxation. Improving activity is initiated by relaxation of the muscles of the lower limbs, then the stomach muscles, chest and back, and finally the muscles of the upper limbs, head, and neck. Another important step in improving the speech engine is to introduce breathing exercises that can interleave the previously described exercises

relaxant. They are extremely important because the right speech is necessary to proper breathing. To obtain sufficient phonation, and for supplying the body with the proper dose of oxygen, the best is the use of rib-abdominal breathing track. The next step in the improvement of breathing exercises is the use of appropriate rehabilitation program in speech therapy exercises. Extremely important in this stage of the exercises facial muscles and facial muscles enabling movements of the lips mouth and tongue. Most effectively control the quality of exercise in front of a mirror. During normal facial muscles should speak sounds, words, and sentences. [9, 10].

### **Massage**

An effective treatment is supporting physical rehabilitation massage. Before treatment ensure adequate room temperature, as patients with Parkinson's disease may be hypersensitive to cold. Too low temperature helps to reduce the superficial blood circulation and will increase muscle rigidity. Patients performed mainly relaxing full body massage. It allows you to improve the systemic circulation, as well as excessive loosening tight muscles. In the course of massage draw attention to the development of the neck muscles, the back, and buttocks. It should also focus on facial massage, during which techniques are used to grinding, performed by the therapist or the patient (in the form of self-therapy) in a circular motion. also use techniques: stroking, rubbing, kneading in a vertical direction to the course of the muscles and vibration carried into the intracardiac. An interesting form of therapy is also a Japanese massage, which focuses on the whole body. The basic technique of this massage is kneading. You can also be used stroking technique and rhythmic compressions, but in smaller amounts with respect to the kneading. Most often connected to the short exercises focussing on improving joint function. The positive impact of the Japanese massage is noted in people with limited range of motion in the shoulder joint. After a series of treatments realized notes a quantitative and qualitative improvement of mobility, in particular during abduction movement. Massage is a supplementary complex physical therapy is often performed prior to exercise in order to facilitate the implementation of the various movements of [9-12].

### **Kinesitherapy**

Because of the progressive movement disorders, cognitive and emotional PD patients avoid physical activity, shut off from family life, professional and social. Research in recent years shows that multidirectional rehabilitation in Parkinson's disease can be effectively used to prevent or reduce complications caused by reduced mobility, whether to learn and train the patient in terms of the ability to use motion compensation strategy. Even the patient is located in a later stage of the disease (with advanced symptoms) can and should be stimulated and encouraged to undertake various activities. It is estimated that rehabilitation in Parkinson's disease is no less important than drug treatment.

The treatment of motion (kinetic therapy) is a factor for activating the central nervous system, which develops so-called physical memory. motor learning. The patient, performing the exercise, reduces the risk of falls by improving coordination and balance. Exercise can be performed individually or in groups. They are isolated (active ingredients from the resistance) of clearance with a therapeutically (passive step-passive, passive-active). The physiotherapy includes: exercises topical (relaxation postisometric, isometric exercise and exercises systemic (breathing relaxation autogenic training Schultz, progressive muscle relaxation, the method PNF Nordic Walking) [3, 11, 13, 14].

## **Summary**

Parkinson's disease is one of the most common diseases of the central nervous system. It is estimated that the total number of patients in Poland is about 70 - 80 thousand, and due to a significant lengthening of life expectancy - is constantly growing. In addition to the most characteristic symptoms of Parkinson's disease, you should still pay attention to the accompanying huge problem, what are the downs. In the case of patients suffering from Parkinson's disease, they take on special significance, because this disease increases the risk of falls as much as 10-fold.

The use of various forms of complementary therapies standard treatment by means of pharmacology and physiotherapy is a very important aspect to combat Parkinson's disease. It is important in improving gait in patients with Parkinson's syndrome has choreotherapy and music therapy, which through the use of sound and rhythm motivate the patient to make spontaneous motor activity. Dance therapy while the patient performs exercises often include all the joints, music therapy, in turn, is

important in improving the quality of speech and psychological well-being. Treatments such as massage and physical therapy bring the greatest results in reducing pathologic muscle tone, moreover, allow to improve blood circulation and relaxation and breathing deepening. Conducted a comprehensive physiotherapy increases ranges of motion in the joints, it helps to improve self-esteem, to motivate the patient to exercise and establish contacts with other patients. In the treatment plays an important role individual selection of therapy, depending upon the symptoms presented and the general health of the patient. Integrated rehabilitation, acting indispensable adjunct to other forms of therapy, should be conducted continuously, in a hospital, outpatient and environmental. The effectiveness of physiotherapy techniques and their positive effect on the broad physical and mental state of patients suffering from Parkinson's disease makes them the important part of an overall therapy aimed at reducing or delaying the effects of the disease [10, 15-19].

## References

1. Rudzińska M. Szczudlik A. Parkinsonizm atlas. Wyd. Uniwersytetu Jagiellońskiego; Kraków 2009.
2. Kuran W. Żyję z chorobą Parkinsona. Wyd. PZWL; Warszawa 2009.
3. Fries W. Liebenstund I. Rehabilitacja w chorobie Parkinsona. Wyd. ELIPSA-JAIM s.c. Kraków 2002.
4. Gąsienica-Szostak A. Muzykoterapia w rehabilitacji i profilaktyce. Wyd. PZWL; Warszawa 2003.
5. Zawadka M. Krajewski S. Muzykoterapia jako forma wspomaganie leczenia choroby Parkinsona. *Valetudinaria Postępy kliniczne medycyny wojskowej*; 2009, 1, 32- 35.
6. McGill A. Houston S. Lee R. Y. W. Dance for Parkinson's: A new framework for research on its physical, mental, emotional, and social benefits. *Complementary Therapies in Medicine*; 2014, 22, 426- 432.
7. Stożek J. Pustułka- Piwnik U. Zastosowanie tańca w rehabilitacji pacjentów z chorobą Parkinsona. *Rehabilitacja medyczna*; 2013, 1, 21- 24.
8. Rycerski W. Grabarczyk B. Żygawska-Biedal M. i wsp. Wyniki rehabilitacji chorych z parkinsonizmem z dodatkowym zastosowaniem choreoterapii. *Rehabilitacja w praktyce*; 2010, 2, 16- 18.
9. Lewicka T. Rodzeń A. Ćwiczenia rehabilitacyjno-logopedyczne dla osób z chorobą Parkinsona. Fundacja „Żyć z chorobą Parkinsona”; Warszawa 2006.



10. Opara J. Pasek T. Kwiatek S. Sieroń A. Aktualne spojrzenie na rehabilitację w chorobie Parkinsona - wybrane zagadnienia. *Aktualności Neurologiczne*; 2010,10(2), 94-99.
10. Magiera L. *Klasyczny masaż leczniczy*. Wyd. BIO- STYL; Kraków 2007.
11. Dobosiewicz A.M., Chyba P., Duda G. i wsp. Rehabilitation in Parkinson Disease. *Journal of Education, Health and Sport*. 2017, 7(6):244-264.
12. Suoh S. Donoyama N. Ohkoshi N. Anma massage (Japanese massage) therapy for patients with Parkinson's disease in geriatric health services facilities: Effectiveness on limited range of motion of the shoulder joint. *Journal of Bodywork & Movement Therapies*; 2015, 20, 1-9.
13. Wieczorowska- Tobis K. Kostka T. Borowicz A. M. *Fizjoterapia w geriatrici*. Wyd. PZWL; Warszawa 2011.
14. Straburzyńska-Lupa A. Straburzyński G. *Fizjoterapia z elementami klinicznymi tom I*. Wyd. PZWL; Warszawa 2008.
15. Stożek J. Pustułka-Piwnik U. Curyło M. Tango argentyńskie w rehabilitacji pacjentów z chorobą Parkinsona. *Medical Rehabilitation*; 2016, 20(1), 33-38.
16. Galińska E. Znaczenie muzykoterapii w rehabilitacji neurologicznej. *Psychiatria Polska*; 2015, 49(4), 835-846.
17. Paszkiewicz-Mes E. Muzykoterapia jako metoda wspomagająca leczenie. *Hygeia Public Health*; 2013, 48(2), 168- 176.
18. Opara J, Małecki A, Mehlich K, Szczygieł J. Rola aktywności fizycznej w zapobieganiu niepełnosprawności w chorobie Parkinsona. *Rehabilitacja Medyczna* 2013; 2: 18- 22.
19. McGill A. Houston S. Lee R. Y. W. Dance for Parkinson's: A new framework for research on its physical, mental, emotional, and social benefits. *Complementary Therapies in Medicine*; 2014, 22, 426- 432.