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## WALKING IN PARKINSON'S DISEASE

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### Abstract

*Aim.* The principal aspiration of this study is to examine how walking can influence the quality of life and symptoms in Parkinson's Disease patients.

*Methods.* Subjects with Parkinson's disease patients, with a mild stage of disease, (Mean  $\pm$  PD: age =  $55 \pm 2.2$  yr; Webster rating scale results =  $10 \pm 9$ , Hoehn and Yahr Scale results =  $1 \pm 1$ , Quality of life questionnaire results =  $25 \pm 5$ ). Each subject from the training group was instructed to walk for a month, firstly once per day and afterwards twice per day. The control group was advised to act naturally for a month.

*Results.* The results of the Quality of life questionnaire were indisputable improved each patient from the training group, showing that walking can improve the life of Parkinson's disease patients.

*Conclusions.* We cannot consider that this method of training and scale analysis is more accurate than others, but this is a study we want to extend on a larger number of patients with more instruments of measure.

*Keywords:* Parkinson's disease, walk, quality of life, scale.

### Introduction

Parkinson's disease is a degenerative disease with a slow progression, that debilitates patients in time, by the occurrence of the akinesia, bradykinesia, hypokinesia, rigidity and tremor (Journal of Neurology, Neurosurgery and Psychiatry, 1994). Typically, the Parkinson's disease patients, manifest gradually slower beginning and fulfilling of the movement, along with a decreased excursion of the movement. The motor symptoms in Parkinson's disease, alter flexibility and balance, since the early stages, therefore, the quality of life and the activities of daily living are affected related to the severity of the disease. Reduction in physical capacity can contribute to the stage of impairment in time. In extension, stringent complications due to gait disorders and postural instability and balance disorders, for example: falling issues or fractures related with falling due to the decline or even loss of the postural reflexes and pneumonia subsidiary to immobilization develop in the following stages of disease. The deterioration of pulmonary function is frequently identified between the early motor symptoms of the disease.

Another important matter that affects patients with Parkinson's disease is the shifting of the center of gravity outside of the support base limits, the patients incline to be more susceptible to fall. Postural instability is a motor symptom of numerous grounds and it reduces the quality of life in Parkinson's disease patients.

The common posture in Parkinson's disease includes: the ventral position of the head and of the body, rounded shoulders, increased flexion of the trunk and bending of the knees. The action of walking strides in the life of human from the beginning of time and usually, this action, under the action of time becomes more and more difficult, but in Parkinson's disease, the modifications of the walking action came earlier in time than in other diseases. The walk is often impaired in Parkinson's disease patients and the most typical adjustments within the gait include: reduced movement, small steps, freezing, loss of the swinging of one or both arms, impulse to lean forward.

Patients with Parkinson's disease lean to have a lower stability in walking, even that they have a slower walk than healthy adults with the same age. The fact that the speed of walking is slower is thought to be a consequence of the fact that the steps are shorter in length and that the frequency of the steps decreases, indicating a decline in activity and a change in the quality of life. Another frequent symptom of the patients is the tiredness that results after walking, even after short distances, and this feature becomes more repeatedly as Parkinson's disease progresses. These deficits increase the fall risk and the mobility complications, mostly while performing intricate tasks while walking. A research (supported by National Institutes of Health) on moderate exercise made on Parkinson's disease patients released

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the following: improvements on motor function and mood, reduction of tiredness, an increase in aerobic fitness and gait speed.

The two most important approaches to improve the adversities experienced were following through the practice of concentration and administering through generating rhythm and the amount and the length of steps.

## Methods

The experimental approach is used due to its appropriateness to the structure of this research, using experimental design with experimental group following the results of pre- and post-walking.

All of the Parkinson's disease patients were recruited from a neurologic private clinic. Patients were separately diagnosed by Dr Docu Axelerad Any, the director of the clinic and each one of the patients fulfilled the standard criteria for idiopathic Parkinson's disease and were negative for dementia, hallucinations or dyskinesia. All of the patients were at Hoehn-Yahr stage II and have the Webster rating scale results between 10-19 and the Quality of life questionnaire results between 25-30.

The first patient from the training group, AS, male, age 56, had a moderate disability according to Webster scale result value of 15 points: severe bradykinesia of hands, moderate rigidity, disturbances of the posture, modifications of the upper extremity swing, moderate modified gate, slightly tremor, moderate immobility, no modifications of the seborrhea, speech slightly modified and requires help in certain critical areas; very slow in performing most activities but manages by taking much time. The recommendations for AS were: to walk in the morning for the first two weeks for 25 minutes, with breaks, and for the last two weeks to walk in the morning and in the afternoon for 25 minutes each time, having the possibility to take breaks. The patient related that in the first week he could complete the time aimed in five sessions, the first two sessions having less than four minutes length. In the second week, he could complete the task only in two to three sessions. In the last two weeks, with two periods of walking per day, he could complete the morning ones without long breaks, but he needed time to accomplish the afternoon ones with 5-6 breaks. Related to the results of the Webster scale value has decreased with a point: the rigidity seems to have softened. The Hoehn and Yahr Scale result is two, and it remained unchanged after the one month of walking. The Quality of life questionnaire results were firstly 24 points and after the month of walking the result was 20 points, with the improving on the mobility, being able to walk outdoors with less help than before the training month, having difficulties only with stairs. The sleeping problems have improved too, needing less time to fall asleep than before. The performing of activities was improved, now being able to manage his activities with

less effort and help from the family than before. Another softened chapter on the Quality of life questionnaire is the vitality, he feeling slightly more energetic. We observed that his posture has slightly improved and his gate became more secure.

The second patient from the training group, MN, age 54, female, had a moderate impairment according to the result (11) points on the Webster scale. She presented a inauguration of a difficulty in hand dexterity, detectable rigidity in neck and shoulders, she had a head flexion slightly forward, with the decreased swing in one arm, requiring several more steps for maintaining the adequate gait, having detectable tremor during finger-to-nose test, having also detectable immobility, she claimed having increased perspiration and a loss of resonance of speech and being very slow in performing most activities. The advice for MN were: to walk in the morning for the first two weeks for 25 minutes, with breaks, and for the last two weeks to walk in the morning and in the afternoon for 25 minutes each time, having the possibility to take breaks. The patient related that in the first week she had to take 2-3 breaks, but in the second week she related a major improvement, she didn't need to take breaks and she felt more stable in making steps. In the third week, it was difficult for her to complete the afternoon walk, but with 3-4 breaks, she succeeded to finish it. In the last week, the breaks were less frequent in the afternoon and absent in the morning, but she couldn't complete the whole programme without stops. The Hoehn and Yahr Scale result is two, and it remained unchanged after the one month of walking, and the Webster scale result remained the same too. Her result on the initial quality of life questionnaire was 27 points and after the month of training, her result was 20 points, with the improvement of: sleeping (initially having great problems with sleeping, using pills every night and now using medication only once or twice per week), her performing in usual activities was slightly improved and from having marked physical discomfort or symptoms, she ended up having only minor soreness and symptoms. From feeling very melancholic, depressed and tired, she sustains that now feels moderate depressed and tired. We observed only a difference on her behaviour, being less negative and having an improved self-confidence, that showed in her posture.

The third patient from the training group, BS, age 55, male, had a moderate impairment, according to the Webster scale result which was 18 points- moderate disability. He had moderate bradykinesia, moderate rigidity in shoulders and neck, a flexed posture, with loss of both arms' swing, with stride moderately shortened, with constant tremor, moderate appearance of depression, along with the immobility of face. The patient requires help in only certain critical areas, although he is slow in performing most activities, he manages, by taking more time. The recommendations for BS were: to walk in the morning for the first two weeks

for 25 minutes, with breaks, and for the last two weeks to walk in the morning and in the afternoon for 25 minutes each time, having the possibility to take breaks. He related that in the first week, he completed the task of walking for 25 minutes in 4 hours, with long breaks between the walking sessions. In the second week, he completed the task in 2,5 to 3 hours. And in the third week, he claimed that he could not walk for 25 minutes in the afternoon achieving the task only 5 to 10 minutes. In the last week, he completed the task only in two days, motivating that it was too difficult for him. The Hoehn and Yahr Scale result is two, and it remained unchanged after the one month of walking, and the Webster scale result remained the same as well. On the quality of life questionnaire, firstly, he obtained 25 points, and after the one month training by walking, his result has changed to 19 points, improving on: mobility, being less dependent on the help of others outdoors, also his sleeping problems have improved, from great to moderate, he stopped waking up in the middle of the night and reduced the dosage of the sleeping pills. Also, he had considerable difficulty in performing usual activities and he became more effectively in performing usual activities. Also, his pain has softened from marked to mild physical discomfort and the level of depression reduced from moderate to slight and his vitality level raised as well as his stress level decreased. We observed a difference in his gait, now being more stable.

The fourth patient from the training group, GG, male, age 54, had a moderate impairment, according to the Webster scale result which was 16 points- moderate disability. He had a beginning stage in bradykinesia of hands, moderate rigidity in neck and shoulders, a beginning arm flexion, with a failure of swinging, with a presence of tremor while walking, with stride moderately shortened, with moderate immobility and an increased perspiration and with a very slow performing in most activities, requiring help in certain critical activities. The recommendations for GG were: to walk in the morning for the first two weeks for 25 minutes, with breaks, and for the last two weeks to walk in the morning and in the afternoon for 25 minutes each time, having the possibility to take breaks. He related that in the first two weeks, he completed the task, but with 2 to 3 breaks per session. In the last two weeks, he proceeded to finish the task, but with 4-5 breaks per the afternoon session. The Hoehn and Yahr Scale result is two, and it remained unchanged after the one month of walking, and the Webster scale result remained the same as well. Firstly, on the quality of life questionnaire, he obtained 23 points, and secondly, after the month of training by walking, he obtained the result of 19 points, by improving the following rubrics: the sleeping improved, from having difficulty to fall asleep, to being able to sleep normally, he is now capable of doing usual activities like eating with less help from the family, being more effective, even though he spends more time trying to complete it. Also, he claims to have an

important change in his symptoms, now having only mild physical discomfort or symptoms and he is feeling less anxious, stressed and nervous and this changes his vitality, now feeling less tired and less weary. We noticed a change in his posture.

The fifth patient of the training group, MD, female, age 52, had a moderate impairment, according to the Webster scale result, which was 13 points- moderate disability. She had a moderate slowing of supination-pronation rate, with a moderately impaired hand function. Her level of rigidity was moderate on neck and shoulders. Her posture was flexed, with stride moderately shortened and in walking with the absence of both arms' swinging and only right hand having tremor while movement. Her immobility was detectable and his speech has a loss of inflection and resonance, but she still provides full self-care. The recommendations for GG were: to walk in the morning for the first two weeks for 25 minutes, with breaks, and for the last two weeks to walk in the morning and in the afternoon for 25 minutes each time, having the possibility to take breaks. She related that in the whole four weeks she could complete the walking training and having short breaks only in the first week and in the third one. The Hoehn and Yahr Scale result is two points, and it remained unchanged after the one month of walking, and the Webster scale result remained the same as well. Firstly, she obtained 21 points at the quality of life questionnaire and after a month, her result was 18 points, with a relieved of the stress rubric, from moderate stress and anxiety to mild stress and the sleep rubric, from waking at night to having a normal night sleep. Also, she related that she is feeling tired and weary. We noticed a change in her appearance.

The first patient from the control group, BD, male, age 55, had a moderate impairment, according to the Webster scale result, obtaining 15 points- moderate disability. He had severe slowing of supination-pronation rate; being unable to write; and having marked difficulty with utensils, also she had a moderate rigidity on neck and shoulders, she had a flexed posture, affecting the head, the hands and the knees, her stride is moderately shortened, having tremor while walking at the left hand and during finger-to-nose test. She had depression features, she manages to self-care, but requires help in certain critical areas; she is very slow in performing most activities, but manages by taking much time. Her Hoehn and Yahr Scale result is two points before and after one month. In the first questionnaire of life quality she obtained 20 points, and after one month, she obtained 21 points at the same questionnaire, now feeling moderately sad and depressed.

The second patient from the control group, GH, male, age 57, had a moderate impairment, according to the Webster scale result, obtaining 12 points- moderate disability. He had: beginning difficulty in hand dexterity,

detectable rigidity in neck and shoulders; head flexed forward, with one arm swing definitely decreased, with turnaround time slowing, gait which requires several more steps, with moderate immobility and having obvious oiliness present, secretion much thicker. His speech was hesitant, with beginning of dysarthria. He is able to live alone and still provides full self-care, but the rate of dressing is definitely impeded. His Yahr Scale result is one point before and after one month. About the results on the life quality questionnaire, he initially obtained 17 points and after one month he obtained the same result, but with a lowering in stress levels and an uprising in physical discomfort, acusing pain in low members.

The third patient, from the control group, LM, female, age 55, had a moderate disability, according to the result she obtained on the Webster scale 13 points. She presented with: incipient bradykinesia of hands, detectable rigidity in neck and shoulders, her head was flexed forward, along with her flexed gait, she had one arm swing definitely decreased, with the presence of the tremor during finger-to-nose test, she has a moderate immobility, and moderate appearance of anxiety, also she has increased perspiration, with thin secretions. Also, her speech was affected, with loss of inflection and resonance. She is able to live alone and still provides full self-care. Her Yahr Scale result is one point before and after one month. Related to the results on the life quality questionnaire, on the first test, she obtained 21 points, and after a month, her score was 23 points, with the aggravation of her anxiety, that affected her night sleep more, now having great problems with sleeping and using medication more often, almost every night.

The fourth patient, from the control group, VM, male, age 53, had a moderate disability, according to the result of 12 points that he obtained on the Webster scale. He presented with: moderate slowing of supination-pronation rate, detectable rigidity in neck and shoulders, with the head flexed forward, with one arm swing definitely decreased, with turnaround time slowed, with the presence of tremor during finger-to-nose test, with detectable immobility. He presents beginning of hoarseness and he requires help in certain critical areas. His Yahr Scale result is one point before and after one month. Related to the results on the life quality questionnaire, on the initial test, he obtained 19 points: he was able to walk without difficulty indoors, but outdoors and on stairs and he has slight difficulties. He had moderate problems with sleeping, he has slight speech difficulties, he was able to perform his usual activities slightly, he had mild physical discomfort. He was feeling slightly sad and melancholic. He was feel slightly anxious. After one month, his quality of life questionnaire result was: 21 points, now having marked physical discomfort and being moderately anxious.

The fifth patient, from the control group, MM, female, age 56, had a moderate disability according to the result of 16 points that he obtained on the Webster scale. He

presented with: moderately impaired hand function, moderate rigidity in neck and shoulders, head flexed forward, with one arm that fails to swing, with a gate that requires several steps, with the presence of tremor during finger-to-nose test, with detectable immobility, with obvious oiliness present, with a hesitant speech, being very slow in performing most activities. Her Yahr Scale result is one point before and after one month. Related to the results on the life quality questionnaire, on the initial test, she obtained 20 points: she was able to walk without difficulty indoors, but outdoors and on stairs she had slight difficulties. She had moderate problems with sleeping, she had slight speech difficulties, she was able to perform my usual activities slightly less effectively, she had mild physical discomfort, she was feeling slightly depressed and worried. Her result on the quality of life questionnaire remained unchanged after one month.

## Discussion

This study is a limited one. The lot of patients who participated in the study is a small number and the research' s duration was not a long one. The authors concede that following studies will be necessary to ensure these results.

## Conclusion

Patients with Parkinson's disease require to check their walking conduct and their assessments or deficiencies regarding to their gait.

We conclude that Parkinson's disease patients can be trained and can change their walking behaviour with the most impact on their quality of life. The results of the Webster scale and Yahr Scale did not change during the one month for any of the patients, but it appeared to be an important change in the quality of life questionnaire's results for the group that practiced walk for a month.

The most important changes occurred at the level of rest and sleep and in reducing the level of depression, anxiety and sadness.

Therefore, walking may improve the mobility in Parkinson's disease and the beneficial effects arise mostly in the department of life's quality.

## References

- Marsden CD. ,1994, Parkinson's disease. *Journal of Neurology, Neurosurgery and Psychiatry*; 57: 672-81.
- Jobges M, Heuschkel G, Pretzel C, Illhardt C, Renner C, et al, 2004, Repetitive training of compensatory steps: A therapeutic approach for postural instability in Parkinson's disease, *Journal of Neurology, Neurosurgery and Psychiatry* 75:1682-1687.

- Gera G, Freeman DL, Blackinton MT, Horak FB, King L. Identification of Balance deficits in people with Parkinson Disease; is the Sensory Organization Test Enough? *Int J Phys Med Rehabil.* 2016; 4(1)  
<http://www.medicalnewstoday.com/articles/279085.php>  
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- Sara Isaacson, Ashley O'Brien, Jennifer D. Lazaro, Arlen Ray and Gerard Fluet, The JFK BIG study: the impact of LSVT BIG on dual task walking and mobility in persons with Parkinson's disease, *Journal of Physical Therapy Science*, 10.1589/jpts.30.636,30,4, (636-641), (2018).
- Josefa Domingos, Danique Radder, Sara Riggare, Caterina Godinho, John Dean, Mariella Graziano, Nienke M de Vries, Joaquim Ferreira and Bastiaan R. Bloem, Implementation of a Community-Based Exercise Program for Parkinson Patients: Using Boxing as an Example, *Journal of Parkinson's Disease*, 10.3233/JPD-191616, (1-9), (2019).