

The effect of Vojta therapy on gait parameters in a patient with multiple sclerosis – a case study

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Abstract

Background: In recent years, many researchers have focused on the problem of patients who have multiple sclerosis. This disease affects more and more younger people who suffer from paresis, balance disorders, and weakening of muscle strength and coordination, which affects the deterioration of gait. The Vojta method ideally improves the quality of movement of people suffering from neurological diseases. Numerous studies prove this.

Aims: The case study aimed to analyze the effect of Vojta stimulation on the change of gait parameters in a man with multiple sclerosis.

Case report: The case of a 56-year-old man who has multiple sclerosis for 7 years (height 178 cm, weight 88 kg, BMI 27.7) is presented. The stage of disease development is rated 5 on the EDSS scale. The patient underwent Vojta therapy 3 times a week for 3 weeks (9 treatments). A single treatment lasted 30 minutes and included reflex crawling therapies. Gait parameters were measured using functional tests prior to the study. After completing the series of treatments, an improvement in gait parameters and better balance maintenance were found.

Summary: In the case of a man with multiple sclerosis for 7 years, the use of the Vojta method in gait therapy improved his parameters. Nevertheless, further clinical trials should be conducted, also based on measuring parameters based on measuring equipment on a larger research group.

Key words

neurological rehabilitation, Vojta method, physiotherapy in neurology, multiple sclerosis, Vojta method for adults, postural control.

Introduction

Multiple sclerosis can cause a variety of symptoms: sensory (40%), pyramidal (40%), cerebellar (25%), and visual (20%). In addition, patients suffering from more serious symptoms in gait support themselves with orthopedic supplies, which clearly limits their ability to function [1].

The degree of disability is assessed using the extended EDSS patient status scale. We can assess the following functions: pyramidal, cerebellar, brainstem, brain, sensation, intestines, urine bladder, and vision.[2]

Among the factors that significantly impair the gait of patients with multiple sclerosis are balance and postural control disorders. The degree of recovery of these disorders can improve functional independence and quality of life. [3]

Vojta reflex locomotion therapy is a specialized type of physiotherapy that was discovered and developed by Czech neurologist and pediatric neurologist Vaclav Vojta in the 1960s. The creator of the method observed that sustained stimulation of pressure on specific points on the patient's body in specific starting positions evokes a widespread motor response in the form of tonic muscle contractions on both sides of the neck, trunk, upper and lower limbs. The result of the stimulation is the improvement of postural control [4].

The intensive development of knowledge results in the selection of newer therapies that improve the functional status of people suffering from multiple sclerosis. The Vojta method, which is used in the treatment of both adults and children, is becoming more and more popular. Its therapeutic use in patients with damage to the central nervous system may result in partial restoration of basic movement patterns. During the therapy, we apply strictly defined pressure in defined parts of the patient's body, which is in a specific position (lying on the stomach, side, and back). Such a stimulus causes, regardless of the motivation of the person undergoing therapy, the

activation of coordination complexes, which are called reflex crawling and reflex turning. During the therapy, there is a coordinated activation of all skeletal muscles and stimulation of the central nervous system at its various levels. After a therapeutic session, the patient gains better access to movement patterns, which can be used in spontaneous motor skills [5].

Used by Prof. Vojta, therapy was the subject of scientific research, which allowed to confirm its effectiveness. The effectiveness of the Vojta method has been empirically proven also in the case of MS patients. It has been reported that reflex locomotion by Vojta activates the trunk and deep muscles of the spine to regulate its stability and increase rotational strength, thus improving the ability to control posture. This may significantly improve the gait parameters in people with multiple sclerosis [5].

Aims

This study aimed to analyze the therapeutic effect of Vojta therapy on gait parameters in a patient who has multiple sclerosis.

Case report

The study involved a 56-year-old man with multiple sclerosis for 7 years (height 178 cm, weight 88 kg, BMI 27.77). The patient is a professionally active person. Due to the development of the disease, he changed his job from manual to office work. The disease development stage assessed according to the McDonald criterion is 5 EDSS. The patient goes for 1km walks every day using Nordic Walking sticks. Before starting therapy, he reported neuropathic pain in the lower limbs, rated at 5 on the VAS scale.

Before starting therapy, the patient's gait was examined by performing standardized functional tests.

- Test Timed Walking Test at a distance of 10m with the assessment of walking time and measuring the number of steps taken.
- Activities-Specific Balance Confidence is a test in which we assess the percentage limit in the performance of everyday tasks, e.g., walking up the stairs, picking up objects from the ground, walking on uneven ground, stairs.
- Berg Balance Scale, which was used to assess balance and risk of falling.

During the therapy, reflex crawling was performed in the prone position. The patient's head was turned alternately to both sides. Head rotation determined the position of the upper and

lower limbs. On the head-turned side, the arm was flexed between 120 and 130 degrees at the shoulder joint, the elbow 45 degrees at the elbow joint, the leg on the occipital side was flexed at the hip 30-40 degrees, and the knee at the knee joint 45 degrees. The upper limb on the occipital side rested freely on the ground with its dorsal part. The lower limb on the facial side was in free extension. Stimulation was carried out over a period of 3 weeks, 3 times a week; each therapeutic session lasted 30'. The calcaneal zone located on the lateral tuberosity of the calcaneus and the zone on the iliac spine located on the inner side of the iliac spine was used for activation. The therapy was carried out twice on each side.

Figure 1. An example patient during Vojta therapy.



Table 1. Summary of the results before and after Vojta therapy.

Functional tests	Before therapy	After therapy
Timed Walking Test 10m	13.25 s and 22 steps	11.56 s and 19 steps
Activies Balance Confidence	525 %	54.375%
Berg Balance Scale	34 scores	42 scores

Discussion

Vojta therapy has been proven in many scientific articles. The latest research conducted by Maria Carratalá “Effect of a rehabilitation program based on Vojta therapy on changes in balance and gait in multiple sclerosis, measured by computer gait analysis” [7] showed a statistically significant difference in the improvement of parameters evaluating the gait pattern, as well as balance parameters in people subjected to Vojta therapy.

The study conducted by Laufens [6] over the years 1994-2012 proved the significant impact of Vojta therapy on the functional status of patients suffering from MS. Speed and stride length improved significantly ($p < 0.0001$). In 16 out of 19 neurologically examined patients, an improvement of 0.25 ± 1 level in the EDSS was obtained. A noticeable improvement was also observed in brain function and muscle strength of the paretic limb.

The research conducted by Luis Perales Lopez et al. [8] in 2021 assessed patients with MS using the Berg balance scale, the tandem test, and the 10m walk test. Although, the intervention with Vojta method therapy gave a significant result compared to the control group in terms of balance variables $p=0.026$ and tandem test $p=0.01$, in the 10m walk test significant improvement was observed in both groups. The research concluded that the Vojta method therapy has the effect on improving balance in everyday activities of balance according to the Berg Balance Scale in comparison with the control group.

In the present case study, there was a 12.8% improvement in speed in the 10m walk test, and the number of steps decreased by 14.7%. The most remarkable improvement was noted in the Berg balance test; after the therapeutic intervention, the patient's balance improved by 23.5%.

The Vojta method is not only applicable in the treatment of people suffering from MS. Many scientific publications prove its positive impact in the therapy of children with cerebral palsy, body posture asymmetry, hip dysplasia.

Summary

Studies show an improvement in gait parameters in a patient who has multiple sclerosis. From the point of therapy view, the changes in the results were significant. The patient had better balance, as demonstrated by the tandem test, one-legged stand, and foot in front of the foot from Berg Balance Scale. This affected the improvement of the support and extension mechanisms of the lower limb, which made the patient feel more confident in walking, climbing stairs, and on uneven ground. The gait became fluent and coordinated, and the number of steps decreased by increasing cadency. Future studies on extending this research subject should consider testing a larger group of people and include measuring equipment, e.g., a treadmill with floor sensors, which will help quantitatively measure the improvement in gait function.

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