Author´s first name and surname: Jiří Otta, BA
Title of the master thesis: *Use of computer based exercise therapy in patients with Parkinson´s disease. Comparation effectiveness of computer based exercise therapy and conventional therapy in parkinsonian pacients with postural instability-pilot study.*
Department: Department of Neurology 1st Faculty of Medicine and General teaching Hospital
Supervisor: As. MUDr. Martina Hoskovcová
Consultant: Mgr. Ondřej Čakrt, Ph.D.
The year of presentation: 2013

Abstract

Introduction:

Stability and walking disorder is an important part of clinical image of Parkinson´s disease (further only as PD) and another neurodegenerative diseases with Parkinson-syndrome aspects (further only as PS). Above all in the late PD – phases stability and walking disorders and falls resulting from them responsible for serious functional restrictions and they can lead up to a self – sufficiency decreasing. In the clinical application for patients with PD are so far ordinarily accepted as a standard the guidelines *Clinical Practice Guidelines* - KNGF (Koninklijk Nederlands Genootschap voor Fysiotherapie – Royal Hollandian Physiotherapeutical Societies). In these days there are appearing new, unconvenional methods in rehabilitation (further only as RHB) of stability disorder and falls in patients with PD coming from usage of virtual reality (further only as VR) – called as computer based exercise therapy (further only as CBT). The target of this thesis is to monitor the possibility of using the new CTB therapy and its use in prevention and decreasing the expansion of instability. Together it compares the CBT effects with a conventional therapy (further only as CT).

Methods:

In the survey took part 14 patients altogether.

1. group of 8 patients was undergoing the CT (average age 65 ± 8,5, 4 women a 4 men, average height 169 ± 22 cm, average disease duration length 10,5 ± 6,5 years, Hoehn & Yahr score in average 2,5 ± 0,5.
2. group of 6 patients was undergoing the CBT (average age 73 ± 9 years, only men, average height 183 ± 15 cm, average disease duration lenght 8,5 ± 1,5 years, Hoehn & Yahr score in average 2,5 ± 0,5.

All probands had to undergo an input and output stability hesly check, which included UPDRS III, MiniBESTest, Sensory Organisation Test – Equilibrium score with the SMART Balance Master machine and a muscular power DKK in an isometric contraction.

Results:

1. The therapy of stability disorder with help of VR on the board Kinect Xbox360 has a bigger effect on the stability improvement measured by the clinical tests than a conventional way of therapy. CBT improves the dynamic unit of stability more than KT. CBT doesn´t lead to better improvement in performing the activity insisting a higher attentive participation - dual task (here measured as a time reduction in TUG dual task activity in the scope of the MiniBESTest), than CT.
2. Increasing of muscular strength of lower extremities doesn´t lead to changes of stability parameters (measured with clinical MiniBESTest) at patients with PD. Increasing of

muscular strenght doesn´t correlate with the improvement of stability parameters (also measured with the clinical MiniBESTest). By means of CT it didn´t lead to gaining more muscular strenght than CBT.
3. Examination of stability with means of the SOT transaction on the BM machine doesn´t correlate with the clinical examination with the MiniBESTest.

Conclusion:

CBT was shown as a effective therapy form in decreasing instability and falls risk factors in patients with PD. We assume that in RHB treatment process of stability disorders in patiens with PD, CBT could stand as a single method.

Key words: computer based therapy, falls, Parkinson´s disease, stability disorders, virtual reality