**Combined Physical Exercises and Cognitive Training as a Part of the Rehabilitation Model in Alzheimer’s Disease**

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**Introduction**

Alzheimer’s disease (AD) is a severe brain neurodegenerative disease affecting body functions. The underlying pathological mechanisms involve several interplaying processes – neurotransmitter, hormones, inflammation, oxidation stress and mitochondrial dysfunction, Alzheimer’s protein production, neurodegeneration, and immune system disturbances (1, 2, 4, 6, 7). Gradual degeneration of brain functions has a profound impact on mental and physical activities, abilities, and quality of life (8, 9, 10). There has been an ever-growing attention for the potential of engaging in home rehabilitation associated with the combination of medication and non-pharmacological interventions for people with AD. In 1989, the research is actively looking for feasible models, which can be implemented in everyday routine clinical practice. One of these highly rehabilitative models is the Brain and Body (11). This model assumes that brain function is naturally correlated with the level of physical activity. Theoretical support for this empirical proposition comes from studies that show the reciprocal relationships in the domains of cognition, brain metabolism, and behavior. The better the physiological performance, the better are motor, and vice versa.

The goal of this presentation is to demonstrate part of our rehabilitation model, a combination of a mild, mainly non-cardiac type of physical exercises in conjunction with cognitive training for AD patients and improves physical capacities.

**Methods**

The present material is a part of our rehabilitation model of AD patients, which involves five phases:

- Educational part
- Section on fighting stress
- Light exercises for the hands and fingers
- Cognistat system
- Repetition and judgment

These five modules are used simultaneously in the office (the educational part of the program) and at home (the physical part of the program (12)). In this program, special attention is paid to both physical exercises and cognitive training, which have been related in brain function (13).

This combined treatment protocol has been designed to use physical (hand exercises in the office setting) and cognitive (training exercises) rehabilitation simultaneously. These exercises are performed both in the office and at home, in a series of 60 months. There have been other researches in this area with similar outcomes. The program for 48 months has been implemented in many patients since 2006, in the Czech Republic (11). The longest number of the patients (120) consists of educational part, or for 60 months. The basic principle of this model is that the combination of physical and cognitive activities can have a positive effect on the patient’s mental and physical functioning (14).

**Results**

We have also been investigating the impact of home exercises on D-16 patients. The patients have been divided into two groups. Group 1 (36 patients) was treated according to the above rehabilitation model for 60 months, and Group 2 (30 patients) was treated according to the rehabilitation model for 48 months. The patients of Group 1 improved in their cognitive and physical abilities (15, 16, 17). During the rehabilitation period, the MMSE score consistently improved, and the patient was able to perform different cognitive tasks, including working memory training, which has a positive effect on the patient’s mental and physical functioning. The results of the study show that the integrated rehabilitation approach can be used to improve cognitive and physical abilities in AD patients (17).

**Conclusion**

A combined strategy for dealing with dementia using rehydration and a combination of physical and motor exercises for office and home use can improve neurocognitive function in patients with Alzheimer’s disease. The combined treatment offers a feasible approach for improving cognitive and physical abilities in AD patients. Future research is expected to improve our understanding of integrated cognitive training strategies in rehabilitation in AD.

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**References**


