

The effect of rehabilitation for Parkinson's disease on body function and smile degree

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Abstract

Body function after rehabilitation for Parkinson's disease and the effect on smile degree were examined. The step and the walking speed were significantly improved in all 22 patients. The smile degrees also increased significantly. The walking speed and the step significantly correlated with smile degree. In patients with Parkinson's disease, it was suggested that the walk function was closely associated with smile degree.

Key words: Body function, rehabilitation, Parkinson's, step, walking speed

Introduction

Parkinson's disease (PD) is progressive nervous disease characterized by the degeneration of nigral dopamine cells, and it is known that psychological stress worsens the symptoms. In PD it is thought that mentation is closely associated with motor function. A new form of rehabilitation for the purpose of removing psychological stress has been provided in our hospital. Outwardly the psychological stress can be easily estimated from the countenance. We focused our attention on the smile degree. In this study, the smile degree and its relation to the body function were examined before and after rehabilitation.

Materials and Methods

Seven men of our hospital Parkinson's disease rehabilitation hospitalization (five

weeks course), 22 people of 15 women in total. They were 53-85 years old, and the average age was 70.5 years old. Contraction of the disease had occurred 2-27 years previously, and the average period was 7.5 years. The step (cm) and the speed (m/min) when walking were used to evaluate the body function. A smile degree 20-second as an evaluation of the smiles with a smile degree sensor (smile scan TM) (Sr, %) was measured.

Physical therapy was given once a day for one hour. As basic training, stretching and muscular strength training of the trunk / lower limbs were conducted. Another therapy program was associated with individual goal setting. Our hospital offers an original therapy program of stress-relief. This treatment contains a recreation-like element. For example, with a Wii (a TV game console), the patients carry out center of gravity movements on a balance board. The physical therapist gives assistance

(instructions and guidance). Also, an instructor is invited, and Tai Chi exercise is performed. In addition, as for the thing of the guidance of the physical therapist, Awa Folk Dance is conducted. This motor induced upper lower limbs and active trunkal movement.

Results

The smile degree (Figure 1a) was significantly improved with $P = 0.039$ after the rehabilitation. The step (Figure 1b) was significantly improved with $P = 0.001$ after the rehabilitation. The walking speed (Figure 1c) was significantly improved with $P = 0.001$. The association between walk function and smile ratio is shown in Figure 2. The step and the smile degree had a significant association with $P = 0.02$ (Figure 2a). As for the walking speed and the smile degree, $P = 0.022$ a significant correlation was obtained (Figure 2b). An improvement of the walk function was shown with the improvement of the expression.

Discussion

In recent years there have been an increasing number of randomized controlled trials assessing the effects of exercise and/or motor training in people with PD. Overall, these trials support exercise and motor training as beneficial in improving walking, balance, muscle strength, and the performance of functional tasks in people with mild-to-moderate PD [1–10]. In order for the findings from this research to be of general benefit to people with PD, therapists need to be able to translate the protocols used in the research into clinical practice [11]. Given the importance of adherence to exercise and motor training programs, strategies to promote adherence in people with PD need to be considered. Providing a high level of supervision seems likely to promote adherence in the short term, as it may enhance participants' commitment to the program.

In the present study, the step and the walking speed were significantly improved in all 22 patients. Similarly, the smile degrees in the lump significantly increased, too. In physical therapy, before and after, the

walking speed / the step had a significant correlation with smile degree. In the patients with Parkinson's disease, the walk function was closely associated with smile degree. It was thought that "stress-relief" might become the aim of new rehabilitation.

References

1. Allen NE, Canning CG, Sherrington C, et al. The effects of an exercise program on fall risk factors in people with Parkinson's disease: a randomized controlled trial. *Movement Disorders*. 2010;25(9):1217–1225.
2. Allen NE, Sherrington C, Paul SS, Canning CG. Balance and falls in Parkinson's disease: a meta-analysis of the effect of exercise and motor training. *Movement Disorders*. 2001;26(9):1605–1615.
3. Ashburn A, Fazakarley L, Ballinger C, Pickering R, McLellan LD, Fitton C. A randomised controlled trial of a home based exercise programme to reduce the risk of falling among people with Parkinson's disease. *Journal of Neurology, Neurosurgery and Psychiatry*. 2007;78(7):678–684.
4. de Goede CJ, Keus SHJ, Kwakkel G, Wagenaar RC. The effects of physical therapy in Parkinson's disease: a research synthesis. *Archives of Physical Medicine and Rehabilitation*. 2001;82(4):509–515.
5. Dibble LE, Addison O, Papa E. The effects of exercise on balance in persons with Parkinson's disease: a systematic review across the disability spectrum. *Journal of Neurologic Physical Therapy*. 2009;33(1):14–26.
6. Ebersbach G, Ebersbach A, Edler D, et al. Comparing exercise in Parkinson's disease – the Berlin BIG study. *Movement Disorders*. 2010;25(12):1902–1908.
7. Ebersbach G, Ebersbach A, Edler D, et al. Comparing exercise in Parkinson's disease – the Berlin LSVT®BIG study. *Movement Disorders*. 2010;25(14):p. 2478.
8. Goodwin VA, Richards SH, Taylor RS, Taylor AH, Campbell JL. The effectiveness of exercise interventions for people with Parkinson's disease: a systematic review and meta-analysis. *Movement Disorders*. 2008;23(5):631–640.
9. Mehrholz J, Friis R, Kugler J, Twork S, Storch A, Pohl M. Treadmill training for patients with Parkinson's disease. *Cochrane Database*

of Systematic Reviews. 2010;(1) Article ID CD007830.

10. Morris ME, Iansek R, Kirkwood B. A randomized controlled trial of movement strategies compared with exercise for people with Parkinson's disease. *Movement Disorders*. 2009;24(1):64–71.

11. Nieuwboer A, Kwakkel G, Rochester L, et al. Cueing training in the home improves gait-related mobility in Parkinson's disease: The RESCUE trial. *Journal of Neurology, Neurosurgery and Psychiatry*. 2007;78(2):134–140

Figure legends

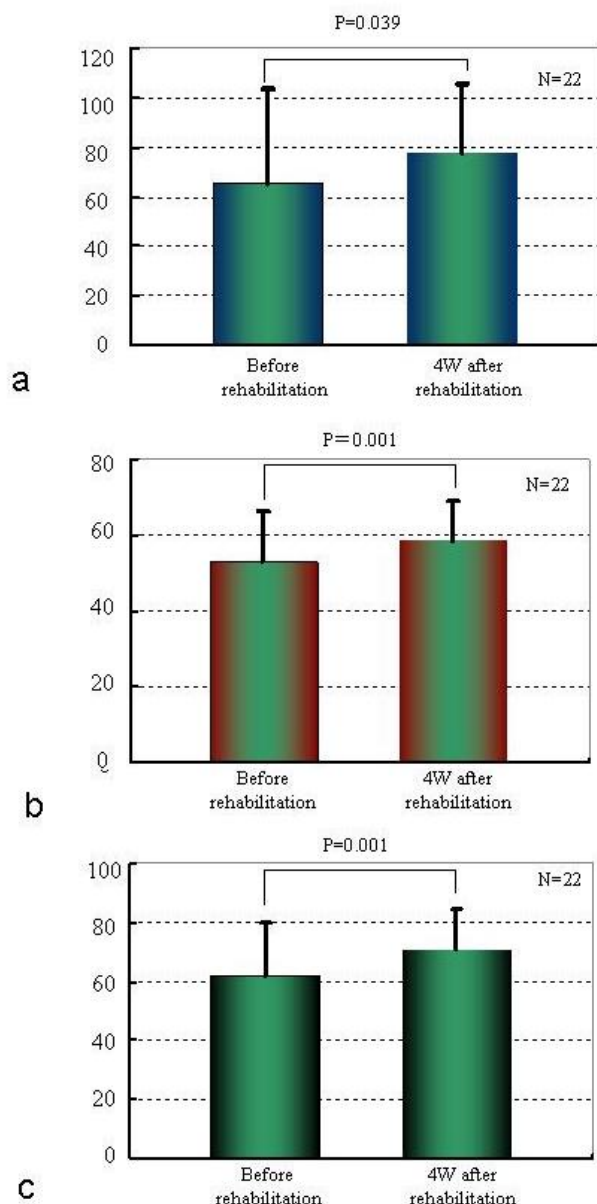


Figure 1. The smile degree (Figure 1a) was significantly improved with $P = 0.039$ after the rehabilitation. The step (Figure 1b) was

significantly improved with $P = 0.001$ after the rehabilitation. The walking speed (Figure 1c) was significantly improved with $P = 0.001$.

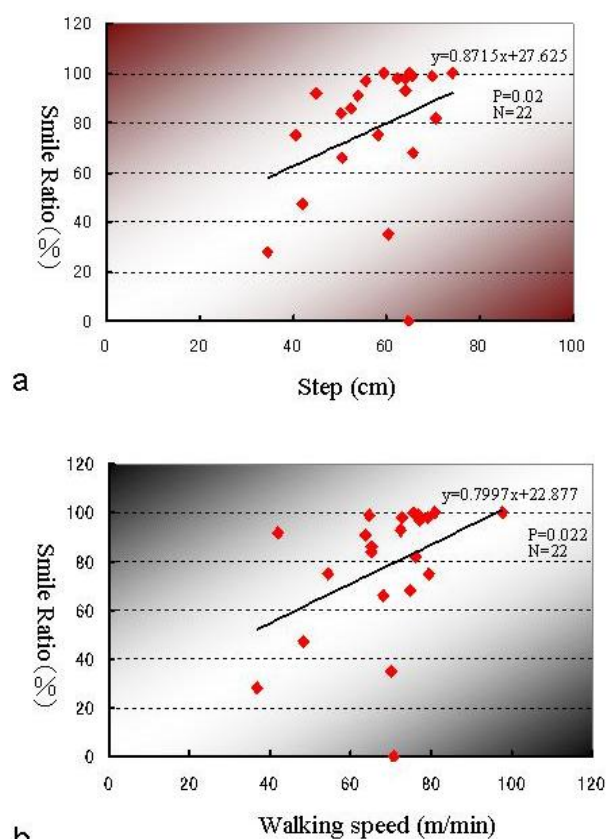


Figure 2. Association between walk function and smile ratio. The step and the smile degree had a significant association with $P = 0.02$ (Figure 2a). As for the walking speed and the smile degree, $P = 0.022$ and a significant correlation were obtained (Figure 2b).