

Relationship between gait cycle variation on 10-m walk and motor function in parkinsonian patients

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Abstract

Objective

The relationship between gait cycle variation (GCV) and other motor functions in patients with Parkinson's disease (PD) was investigated.

Methods

The subjects were 18 outpatients or inpatients with PD (mean age: 71.2 ± 7.7 years). The GCV was evaluated using a small accelerometer (Geito-kun® MG-M1110-HW) and gait analysis software (GaitView® MG-M1110-SV). The Hohen&Yahr grade, maximum 10-m walking velocity, timed up and go test (TUG) results, isometric knee extension strength, and functional reach test (FRT) results were studied as other motor function parameters, and their relationships with GCV were evaluated using correlation coefficients.

Results

The GCV was moderately or markedly correlated with the Hohen&Yahr severity grade ($|r|=0.84$), maximum 10-m walking velocity ($|r|=0.85$), TUG results ($|r|=0.80$), and FRT results ($|r|=0.52$), but not with the knee extension strength.

Conclusion

In parkinsonian patients, GCV was suggested to be related to the severity of the disease, walking ability, and balance ability. Tottori J. Clin. Res. 6(1), 29-34, 2014

Key Words: gait cycle variation (GCV), Parkinson's disease (PD), motor functions, Hohen&Yahr grade

Introduction

PD is a neurodegenerative disease caused by the degeneration/loss of dopaminergic neurons in the substantia nigra. In addition to motor symptoms such as the 4 cardinal signs, tetrad (tremor, akinesia, rigidity, and impairment of postural reflex), hallucination and reduced cognitive function may also appear, and the daily life is markedly affected by a variety of symptoms.

Among these symptoms, gait problems exert

major effects on the daily lives of PD patients.¹⁾ Gait impairment in PD is associated with problems such as an increased likelihood of falling, walking in short steps (demarche à petit pas), frozen gait, festinating gait (pulsion), difficulty in changing direction, decrease or loss of arm swing, reduced trunk rotation, and decrease in the motion range of leg joints.¹⁾

A factor of gait impairment in PD is an increase in the variability of the gait cycle. However, details of gait variation remain largely