

Effect of trans-spinal repetitive magnetic stimulation on posture and motor function in Parkinson's disease

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Introduction

Parkinson's disease (PD) is one of the progressive nervous diseases. The patients suffer complications with abnormal posture such as head dropped syndrome / camptocormia, with frequent aggravation of symptoms. The abnormal posture is treatment-resistant and becomes a factor deteriorating activities of daily living. We performed trans-spinal repetitive magnetic stimulation in PD patients who presented with abnormal posture. The effect on posture and motor function was examined.

Subjects and methods

It was performed on 86 Parkinson patients who presented with abnormal posture (camptocormia). The group which received electromagnetic stimulation and rehabilitation and a drug was called the electromagnetic stimulation group (group A). Group A consisted of 40 patients. The average age was 71±7.3 years old (mean ±SD). Mean disease duration period was 6.6±2.6 years. Hohen and Yahr stage was 3.7±0.3. The group which received rehabilitation and a drug was called the rehabilitation group (group B). Group B contained 41 people. The average age was 74.9±5.4 years old. Mean disease duration period was 4.7±2.8 year. Hohen and Yahr

stage was 3.2 ± 0.4.

The spinal cord repetition electromagnetic stimulation was performed using MagPro (Medtronic company) (Figure 1). The most bent part of the chest lumbar vertebrae was targeted. The measures of 1 cool were eight periods of stimulation at 5Hz, for one second. This was performed twice a week for four weeks (eight cool in total). Walk function / CS-30 / TUG were examined in addition to a camptospasm angle as end-point.

Results

An improvement of the camptospasm angle was clearly found.

The best improvement of the anteversion angle was found in the group receiving the most electromagnetic stimulation (figure 2).

However, no apparent improvement in motor function or Parkinson's disease severity was found (Figure3-4).

Discussion

PD may involve skeletal abnormalities including extreme neck flexion ("dropped head") and truncal flexion (camptocormia) [1]. Camptocormia in PD is defined by marked anteroflexion of the trunk, which abates in the recumbent position, with no or minimal response to levodopa [1-4]. The condition is

exacerbated by walking and is relieved by sitting, lying in the supine position or by volitionally extending the trunk when the patient leans against a wall or a table. Although early reports often attributed camptocormia to a conversion disorder, it is now accepted as an axial feature of Parkinson's disease [5–6].

For patients with Parkinson's disease who had the abnormal posture, an effect on abnormal posture and spinal column excursion was examined. When rehabilitation and repetition electromagnetic stimulation were performed, camptospasm was significantly improved with increase of the trunkal excursion, as previously reported. [7] The improvement of the camptospasm posture was accompanied with an increase of the range of motion.

In other words, there is a possibility that posture was improved through improvement of the muscle tone of the paraspinal muscles. Spinal cord repetition electromagnetic stimulation is a noninvasive and safe manual skill that can be completed within one minute in one enforcement. It may be effective therapy for abnormal posture in Parkinson's disease.

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Figure 1. Magnetic stimulator. MegPro®, Medtronic Ltd.

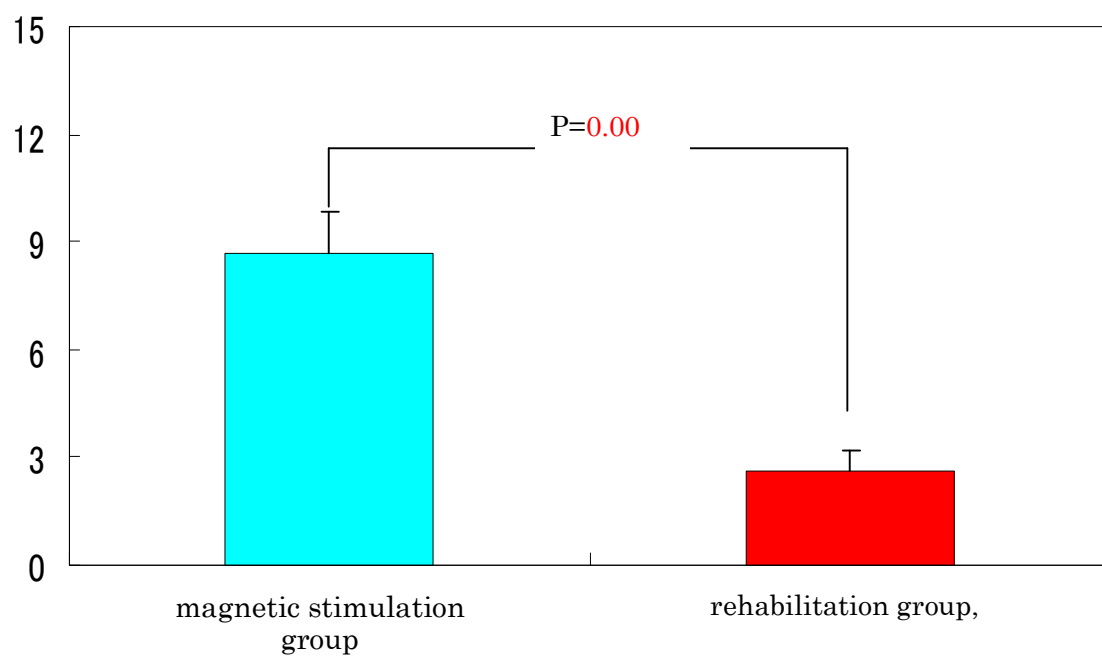


Figure 2. A comparison of the trunkal anteversion improvement angle. The anteversion angle was more improved in the electromagnetic stimulation group.

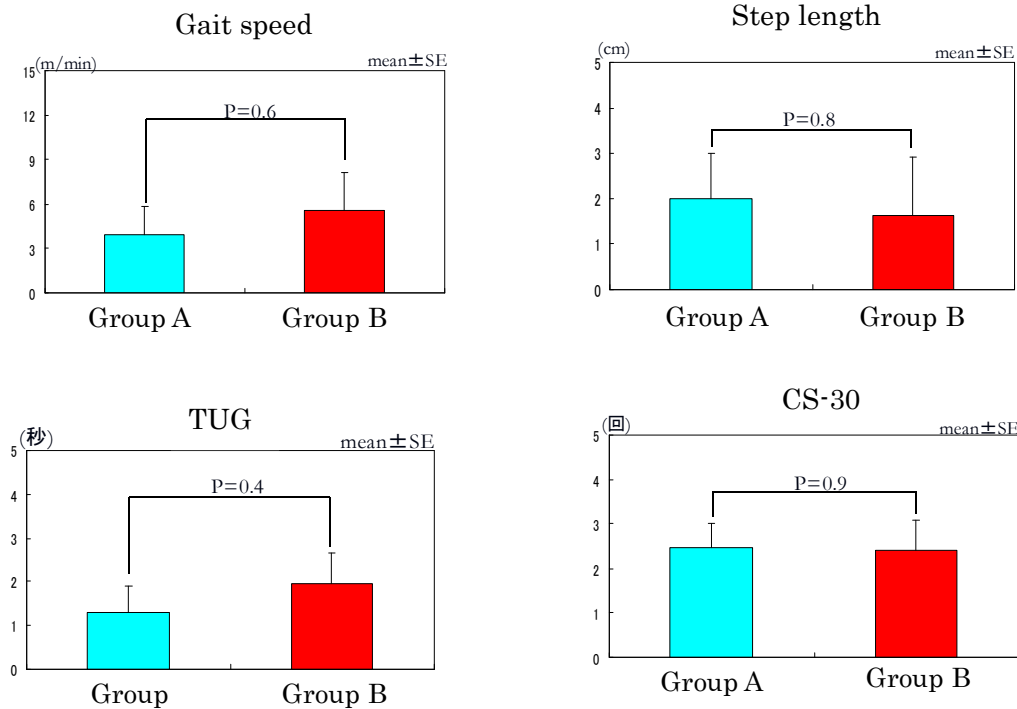


Figure 3. A comparison of improvement of motor function. There were no significant changes between group A (magnetic stimulation group) and group B (rehabilitation group).

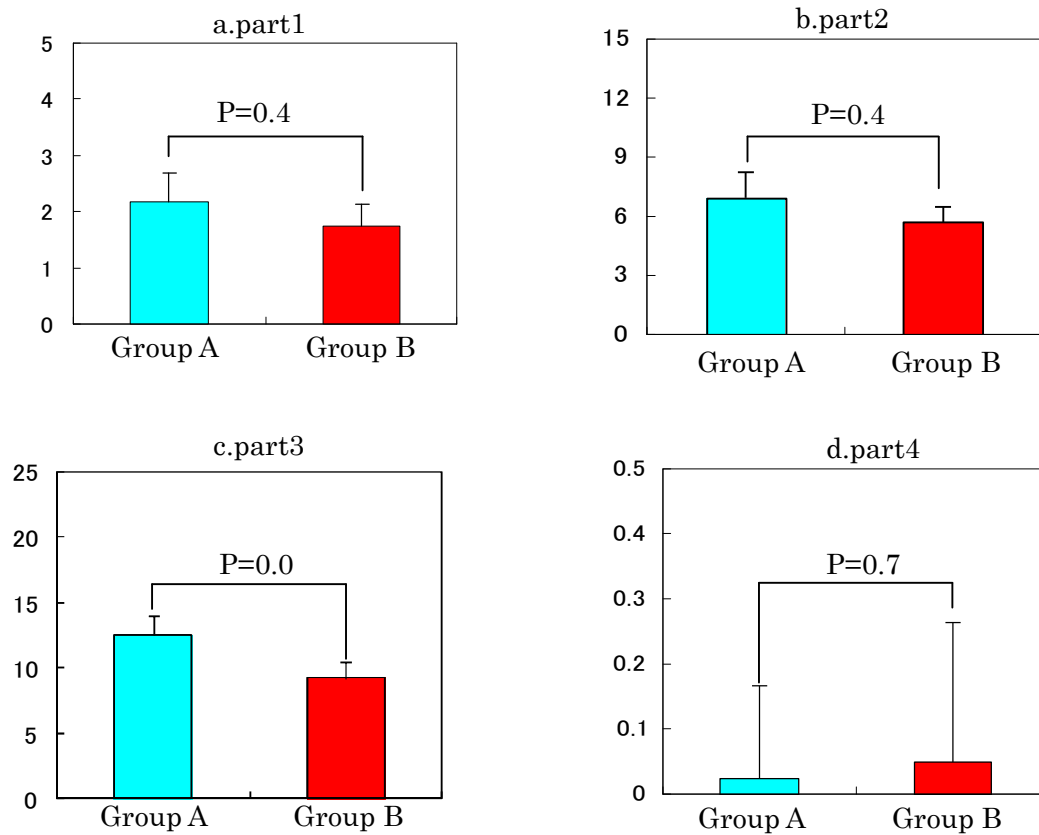


Figure 4. A comparison of improvement of UPDRS. There were no significant changes between group A (magnetic stimulation group) and group B (rehabilitation group).