

Effects of Peripheral Electrical Stimulation on Resting Tremors in Patients with Parkinson`s Disease and Scans Without Evidence of Dopamine Deficits (SWEDDs)

D.Y. Kwon¹, J.H. Heo², G.M. Eom², H.M. Jeon², E.B. Choi²

¹*Neurology, Korea University College of Medicine, South Korea*

²*Biomedical Engineering, Konkuk University, South Korea*

Objectives: Patients with scans without evidence of dopaminergic deficits (SWEDDs) show symptoms (e.g., tremors) similar to those of Parkinson's disease (PD) patients, so they are often misdiagnosed. Sensory electrical stimulation (SES) was reported to suppress essential tremor in patients, but SES was never been applied to patients with PD and SWEDDs. As the pathophysiological mechanisms of PD and SWEDDs are likely to be different, we hypothesized that the effect of SES would also be different in the two patient groups. **Methods:** Fourteen patients with PD and nine with SWEDDs participated in this study. Three wrist muscles were stimulated for 15 s using SES with a stimulation intensity lower than the motor threshold. Angular motion of the index finger was measured via a tri-axial gyrosensor before, during, and after stimulation. Outcome measures included the amplitude and peak frequency of the angular motion of the index finger. **Results:** Tremor amplitude decreased during and after SES in patients with PD ($p < 0.05$). However, tremor amplitudes during and after SES were not different from the base level in SWEDDs patients. The peak frequency of tremors temporarily decreased during stimulation in PD patients but not in SWEDDs patients. SES suppressed tremors in patients with PD, but not with SWEDDs. **Discussion:** The results of this study with further investigation could help understand the pathophysiological differences of tremor between PD and tremulous SWEDDs.