Finger tapping analysis in patients with Parkinson’s disease and atypical parkinsonism

M. Đurić-Jovičić, I. Petrović, M. Ječmenica-Lukić, S. Radovanović, N. Dragašević-Mišković, M. Belić, V. Милер Јерковић, M. Popović, V. Kostić

References:

Abstract:
The goal of this study was to investigate repetitive finger tapping patterns in patients with Parkinson’s disease (PD), progressive supranuclear palsy–Richardson syndrome (PSP-R), or multiple system atrophy of parkinsonian type (MSA-P). The finger tapping performance was objectively assessed in PD (n = 13), PSP-R (n = 15), and MSA-P (n = 14) patients and matched healthy controls (HC; n = 14), using miniature inertial sensors positioned on the thumb and index finger, providing spatio-temporal kinematic parameters. The main finding was the lack or only minimal progressive reduction in amplitude during the finger tapping in PSP-R patients, similar to HC, but significantly different from the sequence effect (progressive decrement) in both PD and MSA-P patients. The mean negative amplitude slope of 0.12/cycle revealed less progression of amplitude decrement even in comparison to HC (0.21/cycle, p = 0.032), and particularly from PD (0.56/cycle, p = 0.001), and MSA-P patients (1.48/cycle, p = 0.003). No significant differences were found in the average finger separation amplitudes between PD, PSP-R and MSA-P patients (pmsa-pd = 0.726, pmsa-psp = 0.363, ppsp-pd = 0.726). The lack of clinically significant sequence effect during finger tapping differentiated PSP-R from both PD and MSA-P patients, and might be specific for PSP-R. The finger tapping kinematic parameter of amplitude slope may be a neurophysiological marker able to differentiate particular forms of parkinsonism.

Keywords:
Atypical parkinsonism, Hypokinesia, Kinematic analysis, Repetitive finger tapping, Progressive supranuclear palsy