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Role of clinical assessment and kinematic analysis for bradykinesia detection in essential tremor

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Introduction: Movement slowness (here specifically referred to as bradykinesia) is a common, yet still unrecognized movement abnormality in patients with essential tremor (ET) [1-3].

Aims: to investigate whether reduced movement velocity in ET patients, as demonstrated by kinematic analysis of finger tapping, is also clinically detectable.

Methods: We retrospectively analyzed the video recordings of finger tapping performed by 58 patients with ET (further divided in two sub-groups: 30 'slow-ET' and 28 'non-slow-ET' according to kinematic analysis[1]), 30 patients with Parkinson's disease (PD) and 30 healthy subjects (HCs). The video assessment was carried out by 4 blinded neurologists, according to the item 3.4 (finger tapping) of the Movement Disorders Society-Unified Parkinson's Disease Rating Scale. We compared the mean scores obtained in the three groups by a Kruskal-Wallis ANOVA. The inter-raters' agreement was calculated by the Fleiss' K.

Results: As expected, Kruskal-Wallis ANOVA showed a significant difference in the blinded finger tapping evaluation between ET, PD and HCs ($p < 0.001$). Namely, the highest scores were observed in PD as compared to the other groups (mean ± standard deviation in PD: 2.21±0.7). In addition, ET had higher video scores than HCs (1.5±0.59 vs. 0.69±0.49, $p < 0.001$). The analysis of the ET subgroups showed higher finger tapping scores in those kinematically categorized as 'slow-ET' compared to the 'non-slow ET' (1.78±0.57 vs 1.2±0.47, $p<0.001$). Finally, we found a moderate to substantial agreement between raters in the three groups (Fleiss K=0.41 for ET, 0.62 for PD and 0.42 for HCs). Among the 'slow-ET' patients, however, 8/30 patients (26.6%) had been considered normal or only slightly impaired at the blinded video evaluation.

Conclusions: The present results may be relevant when considering patients categorization into ET – plus[3], thus emphasizing the need of a careful clinical and kinematic assessment of bradykinesia in ET.

References

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