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Fist Palm Test (FiPaT): a quick bedside test to reveal cognitive dysfunction in Parkinson's disease

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Introduction: The FiPaT is a non-verbal test useful to screen for global cognitive status, attention, and executive functions, and to predict the Mild Cognitive Impairment (MCI) [1]. Four types of errors are possible at FiPaT: Topography, Perseverance, Attention and Planning.

Aims of this study: (I) To reveal cognitive alteration in Parkinson's disease (PD) using FiPaT; (II) to analyze the relationship between FiPaT and cognitive/motor symptoms in PD.

Methods: 102 subjects [51 PD and 51 healthy controls (HC)] matched for age and educational, were administered both a comprehensive neuropsychological battery and FiPaT. PD patients were evaluated for motor symptoms using UPDRS-III and were tested for presence of cognitive alteration and divided in PD - normal cognition (PD-NC) or PD-MCI. These two groups were compared to HC for FiPaT. Subsequently, FiPaT was evaluated in different parkinsonian phenotypes including: postural instability gait difficulty (PIGD), tremor dominant (TD) and presence or absence of freezing of gait (FOG).

Statistical analysis: We measured global score and percentage of errors. The Mann Whitney's U test and contingency tables, were used to measure FiPaT errors between PD and HC, between sub-groups of PD and neuropsychological differences between PD with and without FiPaT errors. A binary logistic regression analysis, with Bootstrap method, was used to investigate the role of FiPaT and of specific errors in identifying MCI in PD patients.

Results: The PD patients performed worse than HC on FiPaT global score ($p = 0.006$). The percentage of errors in topography, perseveration and planning is significantly higher in PD than in HC ($p < 0.05$). No difference in FiPaT global score was found between HC and PD-NC; PD-MCI performed significantly worse on FiPaT than PD-NC ($p = 0.002$). As compared with PD patients with normal FiPaT, PD patients with altered FiPaT performed worse on neuropsychological tests measuring memory, visuospatial and executive skills, but not ideomotor apraxia. UPDRS-III motor score no difference was found between two groups. The logistic regression analysis showed that the FiPaT predicted the presence of MCI in PD with a variance of 24% ($p = 0.023$). Topographic and attentional errors predicted the presence of MCI in PD, with a variance of 31% ($p < 0.021$ e $p < 0.013$, respectively). There were not significant differences on FiPaT between motor PD sub-groups but the TD subgroup showed more planning errors than the PIGD ($p = 0.014$). Patients with FOG had significantly higher percentage of attention errors at FiPaT than patients without FOG ($p = 0.023$).

Discussion: The FiPaT is a bedside test useful to reveal cognitive dysfunction in PD. Worse performance on FiPaT is associated with worse cognitive performance. Different motor PD phenotypes are associated with specific errors in the FiPaT.

Conclusions: Nonketotic hyperglycemia is an unusual, potentially easily-treatable cause of chorea-ballismus. Early recognition is crucial in order to start a prompt management and prevent further

complications. HHHS should always be suspected in new-onset chorea/hemichorea, even in patients with no history of diabetes. The prognosis is excellent in most of the cases.

References:

[1] Cuoco S, Erro R, Carotenuto I, Picillo M, Pellecchia MT, Barone P. Fist-Palm Test (FiPaT): a bedside motor tool to screen for global cognitive status [published online ahead of print, 2022 May 30]. *Neurol Sci.* 2022;10.1007/s10072-022-06129-1. doi:10.1007/s10072-022-06129-1.