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Effect of cognitive reserve on cognitive function in Parkinson's disease: a preliminary analysis

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Introduction: Cognitive reserve (CR) has been proposed to explain the difference between the degree of brain pathologies and the clinical outcome of the cognitive profile. However, the available studies on Parkinson's disease (PD) have mainly investigated CR through only one proxy measure, such as education level, and not as a multidimensional factor.

Objective: We examined the possible effect of the CR, measured through a standardized tool, on the neuropsychological function of PD patients.

Methods: A total of 16 patients with PD (5 female, mean [\pm SD] age 57 ± 6.73 years) were included in this study. All patients underwent the Montreal of Cognitive Assessment (MoCA) [1] to assess cognitive function and CR was evaluated by Cognitive Reserve Index questionnaire (CRIq) [2]. According to CRIq score, patients were divided into two subgroups: low-medium score (≤ 114) vs. medium-high score (> 114).

Results: Univariate linear regression analysis showed a significant association between CR and cognitive function ($\beta = 0.037$; SE = 0.013; t-value 2.728; $p = 0.016$). Comparison between subgroups showed that PD patients with medium-high CRIq scores had better cognitive performance (CRIq score ≤ 114 vs. CRIq score > 114 ; mean \pm SD raw MoCA score 24.25 ± 1.28 vs. 26.63 ± 1.30 ; $p = 0.012$) and longer disease duration (CRIq score ≤ 114 vs. CRIq score > 114 ; mean \pm SD 8.88 ± 2.36 vs. 11.63 ± 2.39 ; $p = 0.036$).

Discussion: Our preliminary results suggest that higher CR might be correlated with better cognitive function and a lower risk of longitudinal progression to Mild Cognitive Impairment in PD. More systematic and longitudinal studies in large PD cohorts are needed to better understand the relationship between CR and neuropsychological outcome.

References:

- [1] Santangelo et al. (2015) Normative data for the Montreal Cognitive Assessment in an Italian population sample. *Neurological Sciences*, 36(4), 585-591.
- [2] Nucci et al. (2012) Cognitive Reserve Index questionnaire (CRIq): a new instrument for measuring cognitive reserve. *Aging Clin Exp Res* 24(3):218-26.