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Gender differences and cognitive reserve in people with Parkinson's disease: possible interactions and effects on cognitive domains

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Introduction: Although there are several studies on Cognitive Reserve (CR) and Gender Differences (GDs) in the phenotypical expression of Parkinson's Disease (PD) [1-2], the results are still controversial.

Objective: To investigate the effects of GDs and CR on global cognitive functioning and different cognitive domains in People with PD (PwPD).

Methods: Fifty-six PwPD (Age: 69.48±6.68ys, H&Y: 1.50-3, Male/Female=29/27) were recruited at IRCCS Don Carlo Gnocchi Foundation (Milan). Motor and overall cognitive functioning were assessed respectively by the MDS-UPDRS-Part III [3] and the Montreal Cognitive Assessment (MoCA Test) [4] while the CS was evaluated through the Cognitive Reserve Index-questionnaire (CRI-q) [5]. Median of CRI-q global score was used to split participants in two groups: high-CR and low-CR PwPD. Linear models were performed on each neuropsychological test to explore the impact of CRIq (high/low), gender (male/female) and interaction CRIq*Gender, including age as covariat

Results: A significant impact of CR was observed for several MoCA sub-scores, visuospatial (p=0.049) and executive (p=0.022) abilities, attention (p=0.032), Raven's Matrices (p=0.015), verbal span forward (p=0.023) and backward (p=0.004), copy of Rey's Figure (p=0.047), test of imitation gestures (p=0.023) and verbal fluency (p=0.023). A main effect of gender was reported for Immediate free recall (p=0.014) and delayed free recall (p=007) with female PwPD showing a better performance than male PwPD. A significant interaction CRIq*Gender was obtained in attentional matrices (p=0.058), TMT part B (p=0.019), TMT part B-A (p=0.035), Symbol Digit Modalities Test (SDMT) (p=0.064) and Immediate free recall (p=0.031).

Conclusions: Higher CR might be correlated with better cognitive functions on several domains regardless of gender, supporting that CR may help to cope with the initial PD cognitive difficulties. Furthermore, a higher level of CR was found to be beneficial in female rather than in men PwPD. Further studies are necessary to investigate how CR and GDs modulate cognitive impairment in PD.

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