Relationship Between Perceived Stress and Cognitive Impairment in Parkinson's Disease

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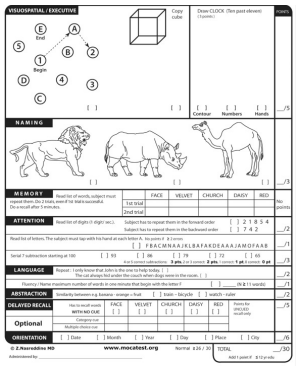
Introduction

- Parkinson's disease (PD) is a neurodegenerative disorder characterized by progressive symptoms including motor dysfunction, speech disorders, swallowing problems, and cognitive decline. The clinical presentation of PD varies significantly from person to person.[1, 2]
- Chronic stress worsens both motor and cognitive symptoms of Parkinson's disease and could even be a trigger for the condition.[3]
- The objective of this study is to examine whether perceived stress in people with PD is correlated with severity of cognitive impairment, as shown by patient scores on the Perceived Stress Scale (PSS) and Montreal Cognitive Assessment (MoCA).
- This study also examined the baseline scores on the MoCA between the patients with Parkinson's disease and healthy controls.
- The MoCA is a widely used and well-validated test designed to screen for cognitive impairment across various domains.

Methods

- Participants diagnosed with Parkinson's disease and healthy controls were enrolled in this study to assess cognitive performance.
- Both groups of participants were administered the Montreal Cognitive Assessment. They were also administered a self-report measure to assess their perceived level of stress.
- Parkinson's disease cohort (n=24) and healthy controls (n=24) were matched with respect to age and education level.

MoCA



Regression Analysis: predictors of MoCA scores in patients with PD

Model		Unstandardized	Standard Error	Standardized[a]	t	p
H_0	(Intercept)	22.875	0.815		28.069	< .001
H_1	(Intercept)	39.844	7.342		5.427	< .001
	Age	-0.045	0.105	-0.091	-0.426	0.675
	EDU	-0.935	0.416	-0.480	-2.248	0.037
	PSS	0.002	0.117	0.003	0.016	0.987
	Gender (Female)	0.765	1.631		0.469	0.644

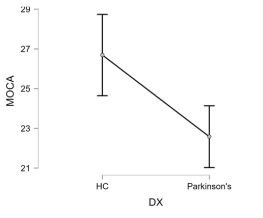
R = 0.531; R^2 – 0.282

Regression Analysis: predictors of MoCA scores in healthy controls

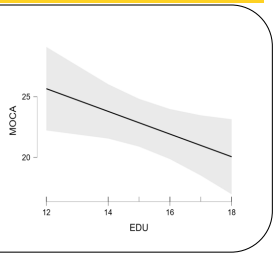
Model		Unstandardized	Standard Error	Standardized[a]	t	p
H_0	(Intercept)	24.917	0.564		44.177	< .001
H_1	(Intercept)	35.852	5.631		6.367	< .001
	Age	-0.053	0.069	-0.099	-0.767	0.447
	DX (Parkinson's)	-4.107	1.068		-3.847	< .001
	Gender (Female)	0.538	1.043		0.516	0.609
	EDU	-0.321	0.190	-0.211	-1.687	0.099
	PSS	-0.040	0.071	-0.071	-0.566	0.575

R = 0.593; R^2 – 0.351

Effect of PD Diagnosis on MoCA Score



Effect of Education on MoCA score in PD cohort



Results

- Our study showed that there was no significant correlation between the Perceived Stress Scale score and the MoCA score (p = 0.575), which contradicts our initial hypothesis.
- Patients with Parkinson's disease had significantly lower scores on the MoCA (p = <.001) than the healthy controls, which is consistent with previous research.
- Greater cognitive impairment, measured by performance on the MoCA, was only associated with a diagnosis of Parkinson's disease when compared to the healthy controls.
- For healthy controls, age and education did not have a significant impact on MoCA scores, whereas in those with Parkinson's disease, higher education levels were unexpectedly negatively correlated with MoCA scores.

Conclusion

- Though our results showed no significant correlation between the Perceived Stress Scale and cognitive performance, this experiment was limited by small sample size.
- Further research with a larger sample size is needed to draw more definitive conclusions about the relationship between perceived stress and cognitive performance in patients with Parkinson's disease.
- Additionally, this is an ongoing study, and longitudinal analyses may help to understand the cumulative effect of stress on patients with Parkinson's disease.

References

1. Bartels, A. L. & Leenders, K. L. (2008). Parkinson's disease: The syndrome, the pathogenesis and pathophysiology. *Cortex, 45*(8), 915-921. doi:10.1016/j.cortex.2008.11.010.
2. Bloem, B. R., Okun, M. S., & Klein, C. (2021). Parkinson's Disease. *The Lancet, 397*, 2284-2303. doi:10.1016/ S0140-6736(21)00218-X.
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