Influence of gender and motor phenotype on Mild Cognitive Impairment in Parkinson's disease: the PArkinson's disease COgnitive impairment Study

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Introduction

Gender and phenotype differences have been thoroughly studied both in motor and non-motor symptoms of Parkinson disease (PD), but the possible role of gender and motor phenotype in the development of cognitive impairment in PD is still unclear. The aim of the present study was to evaluate the clinical and cognitive-behavioral features of PD with Mild Cognitive Impairment (PD-MCI) in a large, hospital-based, cohort of PD patients and the possible gender and phenotype differences in its occurrence.

Materials and Methods

The **PA**rkinson's disease **CO**gnitive impairment **S**tudy (**PaCoS**) is a multicenter study involving two Movement Disorder centres located in Southern Italy. Patients affected by PD diagnosed according to the Gelb's diagnostic criteria (1) were consecutively enrolled in the study. PD-MCI was diagnosed with modified level-II Litvan's criteria (2), including specific cognitive tasks evaluating memory, language, attention and executive functioning. PD severity was evaluated with the Unified Parkinson's Disease Rating Scale – Motor Evaluation (UPDRS-ME) and the Hoehn-Yahr (HY) scale. The basic Activities of Daily Living and the Instrumental Abilities of Daily Living were used to evaluate functional status in PD subjects. Univariate and multivariate logistic regression analysis was used to test the association between variables.

Results

The study included 627 PD patients (57.4% men; mean age 67.9±9.6 years), with a mean age at onset of 64.4±10.5 years, and a mean disease duration of 3.5±4.8 years. The mean UPRDS-ME score was 25.9±13.5 with a mean HY stage of 2.0±0.7. Fifty-nine (9.4%) patients were classified as PD with dementia and were excluded from the current analysis. PD-MCI was diagnosed in 303 (48.4%) subjects, and was more common among men than women (62% versus 37.9%, respectively). Univariate logistic regression analysis showed that presence of PD-MCI was significantly associated with male gender, old age, posture and gait instability (PIGD) motor phenotype, and HY stage. Multivariate, unconditional, logistic regression analysis showed a significant positive association between male gender and PD-MCI with an adjusted OR of 1.81 (95%CI: 1.19-2.75) and UPDRS-ME, with an OR of 1.02 (95%CI 1.00-1.03). Furthermore, an increased risk of PD-MCI was recorded among PIGD phenotype with an OR of 1.60 (95%CI 1.07-2.02).

Baseline characteristics of the entire PaCos sample

	Normal cognition (n=265)	PD-MCI (n=303)	PDD (n=59)	Total (n=627)
Sex (M)	145 (45.1%)	188 (62.0%)	27 (45.7%)	360 (57.4%)
Age	64.9 ± 9.9	69.8 ± 8.7	71.3 ± 8.4	67.9 ± 9.6
Education	8.0 ± 4.8	7.6 ± 4.6	7.2 ± 4.1	7.7 ± 4.7
Age at onset of PD	62.0 ± 10.5	66.5 ± 9.8	64.4 ± 11.5	64.4 ± 10.5
Disease duration	2.9 ± 3.9	3.4 ± 4.3	6.8 ± 8.2	3.5 ± 4.8
UPDRS-ME	22.8 ± 11.8	25.8 ± 12.6	40.9 ± 15.4	25.9 ± 13.5
Hoehn-Yahr stage	1.9 ± 0.5	2.0 ± 0.6	2.8 ± 0.9	2.0 ± 0.7
Phenotype (n=602)				
- TD	95 (37.4%)	76 (25.8%)	10 (19.2%)	181 (30.1%)
- PIGD	133 (52.4%)	184 (62.4%)	36 (69.2%)	354 (58.8%)
- Mixed	26 (10.2%)	35 (11.9%)	6 (11.5%)	67 (11.1%)

Logistic regression analysis

	Univariate analysis			Multivariate analysis		
	OR	95%CI	p-value	OR	95%CI	p-value
Sex (M)	1.34	0.96-1.88	0.086	1.81	1.19-2.75	**0.006**
Age	1.06	1.04-1.08	0.000	1.05	1.02-1.07	**<0.0001**
Education	0.98	0.94-1.01	0.244	/	/	/
Age at onset	1.04	1.03-1.06	0.000	/	/	/
Disease duration	1.03	0.99-1.07	0.159	/	/	/
Age at onset				/	/	/
≤ 60	1	/	/	/	/	/
>60	2.28	1.60-3.26	0.000	/	/	/
Age at onset				/	/	/
≤ 50	1	/	/	/	/	/
51-65	1.75	0.97-3.14	0.062	/	/	/
>65	3.82	2.16-6.75	0.000	/	/	/
UPDRS-ME	1.02	1.01-1.03	0.005	1.02	1.00-1.03	**0.03**
Hoehn-Yahr	1.57	1.17-2.10	0.002	/	/	/
Phenotype						
- TD	1	/	/			
- PIGD	1.73	1.19-2.52	0.004	1.50	0.96-2.35	**0.07**
- Mixed	1.68	0.93-3.04	0.084	1.44	0.70-2.95	0.3

Conclusion

About half of patients with PD in the PaCoS showed a MCI phenotype, thus confirming previous data collected by hospital-based samples with the latter condition (3). PD-MCI was significantly more frequent in men with the PIGD phenotype. Prospective data on our cohort will confirm if the present findings would be useful in predicting progression to dementia in PD-MCI.

References

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