Non-motor determinants of cognitive performances in a cohort of PD patient's siblings.

L. Baldelli[1], L. Sambati[1,2], G. Giannini[1,2], G. Calandra-Buonaura[1,2], P. Cortelli[1,2] and F. Provini[1,2]

[1)] Dipartimento di Scienze Biomediche e NeuroMotorie (DIBINEM), Università di Bologna, Bologna, Italy; [2)] IRCCS, Istituto delle Scienze Neurologiche di Bologna

Introduzione

PD originates from a complex interplay of genetics and environment [1]. Moreover, PD progressively develops over years, during which non-motor symptoms (NMS) such as cognitive impairment can precede the appearance of motor dysfunction [2]. Scarce is the evidence of how cognitive impairment interweaves with other non-motor markers in a cohort at increased "familial" risk of neurodegeneration such as PD siblings. The aim of the study is to evaluate cognitive performances in non-affected siblings (Sibs) of Parkinson's Disease (PD) patients and how the presence other non-motor signs and symptoms could affect them.

Metodi

Within the PROPAG-AGEING Phase 2 project, 100 siblings of PD patients from Bologna underwent a brief evaluation of cognitive impairment by means of Montreal Cognitive Assessment (MoCA) [3]. Clinical and neurological evaluations including demographics, comorbidities and non-motor symptoms such as RBD, hyposmia, and symptoms of dysautonomia were also performed.

Risultati

Siblings (44% males) presented with a mean age of 63.64±9.64 years and were 3.24±6.63 years younger than their relatives with PD; their mean education was 11.12±4.09 years (Table 1).

Siblings obtained a mean corrected MoCA score of 25.39±2.98 points, 44 scored below the cutoff value of 26 (Table 2). 10 Sibs reported symptoms of constipation, 7 of thermoregulatory dysfunction and other 7 of depression; 9 Sibs were anosmic (age and sex corrected), 9 scored positive at RBD screening questionnaire. 7 male Sibs referred erectile dysfunction (Figure 1).

After correcting for education and age, the 5 Sibs referring symptoms of orthostatic hypotension scored 2.71 points less than the others (CI:-5.19 - -0.23; p=0.032), this was largely due to the effect on memory tasks [-1.93 (CI -3.28 - -0.58) points, p=0.006]. The result was replicated adopting the Italian validated available corrections (p=0.041 and p=0.047 respectively) (Figure 2).

Neither the presence of other non-motor symptoms nor their association, affected Sibs cognitive performances or increased the risk of being below the norm.

Conclusioni

PD siblings show in general normal cognitive performances at MoCA, non-motor symptoms alone do not affect general cognition. The outlined effect of orthostatic hypotension in our results could underline either a susceptibility towards an underlying neurodegenerative process or a direct effect of chronic reduced cerebral blood flow during daytime on cognitive tasks.

↓ **Table 1.** General and Prodromal features of PD Siblings.

	PD Siblings
	n=100
Age (mean ± SD)	63.64 ± 9.64
Males (%)	44 (44%)
Education (mean ± SD)	11.12 ± 4.09
Comorbidities	
Hypertension (%)	29 (29.0%)
Diabetes (%)	4 (4.0%)
Dyslipidemia (%)	22 (22.0%)
Hyperuricemia (%)	4 (4.0%)
Depression (%)	7 (7.0%)
Sleep	
RBDSQ – Score (mean ± SD)	1.94 ± 1.82
– Positive (%)	9 (9.0%)
Olfaction	
SSS Score (mean ± SD)	9.06 ± 2.35
Anosmic (%)	9 (9.0%)
Autonomic Functions	
Orthostatic symptoms (%)	5 (5%)
Constipation symptoms (%)	10 (10%)
Erectile symptoms (n=44 - %)	7 (14.3%)
Thermoregulatory symptoms (%)	7 (7.0%)
MDS-UPDRS	
Part I (IQR)	1 (0 – 2)
Part III (IQR)	1 (0 – 2)
Total (IQR)	2,5 (1 – 4)
Mild motor PD signs (%)	1 (1%)

↓ **Table 2.** Cognitive performances of PD Siblings.

	PD Siblings
	n=100
General Cognition	
Raw MoCA Score (mean ± SD)	24,00 ± 2,37
MoCAc Score - Standard (mean ± SD)	25.39 ± 2.38
Abnormal MoCA - Standard (%)	44 (44.0%)
MoCAc Score – Conti et al. (mean ± SD)	22.82 ± 2.91
Abnormal MoCA - Conti et al. (%)	4 (4.0%)
MoCAc Score – Santangelo et al. (mean ± SD)	24.47 ± 2.93
Abnormal MoCA - Santangelo et al. (%)	1 (1.0%)
Cognitive Areas	
- Visuospatial-executive (mean ± SD)	4.34 ± 0.97
- Language (mean ± SD)	4.93 ± 1.08
- Attention, Concentration, Working Memory (mean ± SD)	5.59 ± 0.67
- Abstraction (mean ± SD)	1.48 ± 0.64
- Short-term Memory (mean ± SD)	2.23 ± 1.53
- Orientation (mean ± SD)	5.88 ± 0.33

← ↓ **Figure 2.** General cognitive performances in Sibs with and without symptoms of orthostatic hypotension, corrected by means of the different available validations.

↓ **Figure 1.** Distribution of Prodromal PD markers in the cohort.

Bibliografia

1. Kalia LV, Lang AE. Parkinson's disease. Lancet 2015;386(9996):896-912.
2. Berg D, Postuma RB, Adler CH, et al. MDS research criteria for prodromal Parkinson's disease. Mov Disord 2015;30(12):1600-1611.
3. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H. The Montreal Cognitive Assessment, MoCA: a briefscreening tool for mild cognitive impairment. J Am Geriatr Soc. 2005 Apr;53(4):695-9.

XV CONGRESSO NAZIONALE
12 – 14 MARZO 2020 - FIRENZE