Parkinson's disease burden and comorbidities: a cross-sectional cohort-study

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OBJECTIVE

To evaluate the influence of comorbidity on clinical phenotype, dopaminergic function and CSF biomarkers in a population of de novo Parkinson's disease (PD) patients.

BACKGROUND

Whilst neurodegeneration of the substantia nigra is the primary contributor to cardinal motor symptoms of PD, it is unclear whether co-occurring comorbidities may also be contributory to PD pathology, and whether they have an impact on clinical phenotype. There is a natural increased likelihood of being diagnosed with other diseases of urinary/digestive/circulatory system, because of the autonomic and clinical features of PD, and the higher prevalence of non-motor symptoms in PD patients compared to healthy controls [1, 2]. Though several studies have established that PD is accompanied by substantial comorbidity, the impact of comorbidity on motor and non-motor symptoms, imaging and CSF biomarkers remains to be explored.

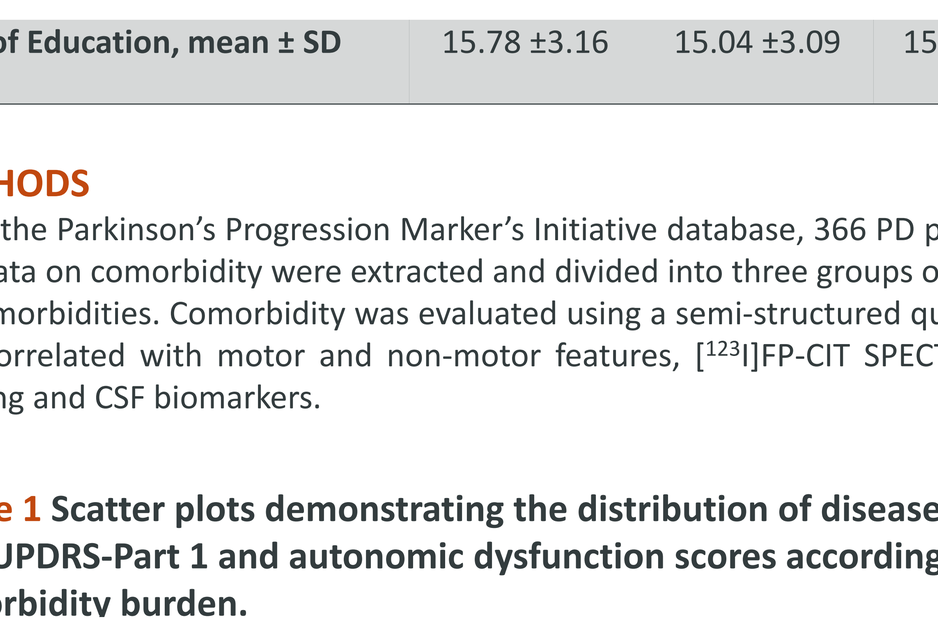
Table 1 Demographic Characteristics for PD-comorbidity groups

	0-1 comorbidities	2-4 comorbidities	≥5 comorbidities
Number of subjects	36	162	168
Age at screening, mean ±SD*	58.70 ±9.10	60.70 ±10.17	63.65 ±9.03
Gender male, % (n)	77.80 (28)	65.40 (106)	61.30 (103)
Age at onset, mean ±SD	58.21 ±8.95	60.22 ±10.19	63.01 ±8.98
PD duration (months), mean ±SD*	5.81 ±5.83	5.80 ±5.59	7.72 ±7.36
Family history of PD, % (n)	16.70 (6)	27.80 (45)	25 (42)
Year of Education, mean ± SD	15.78 ±3.16	15.04 ±3.09	15.94 ±2.92

METHODS

Using the Parkinson's Progression Marker's Initiative database, 366 PD patients that had data on comorbidity were extracted and divided into three groups of 0-1, 2-4 or ≥5 comorbidities. Comorbidity was evaluated using a semi-structured questionnaire and correlated with motor and non-motor features, [^{123}I]FP-CIT SPECT molecular imaging and CSF biomarkers.

Figure 1 Scatter plots demonstrating the distribution of disease duration, age, UPDRS-Part 1 and autonomic dysfunction scores according to comorbidity burden.

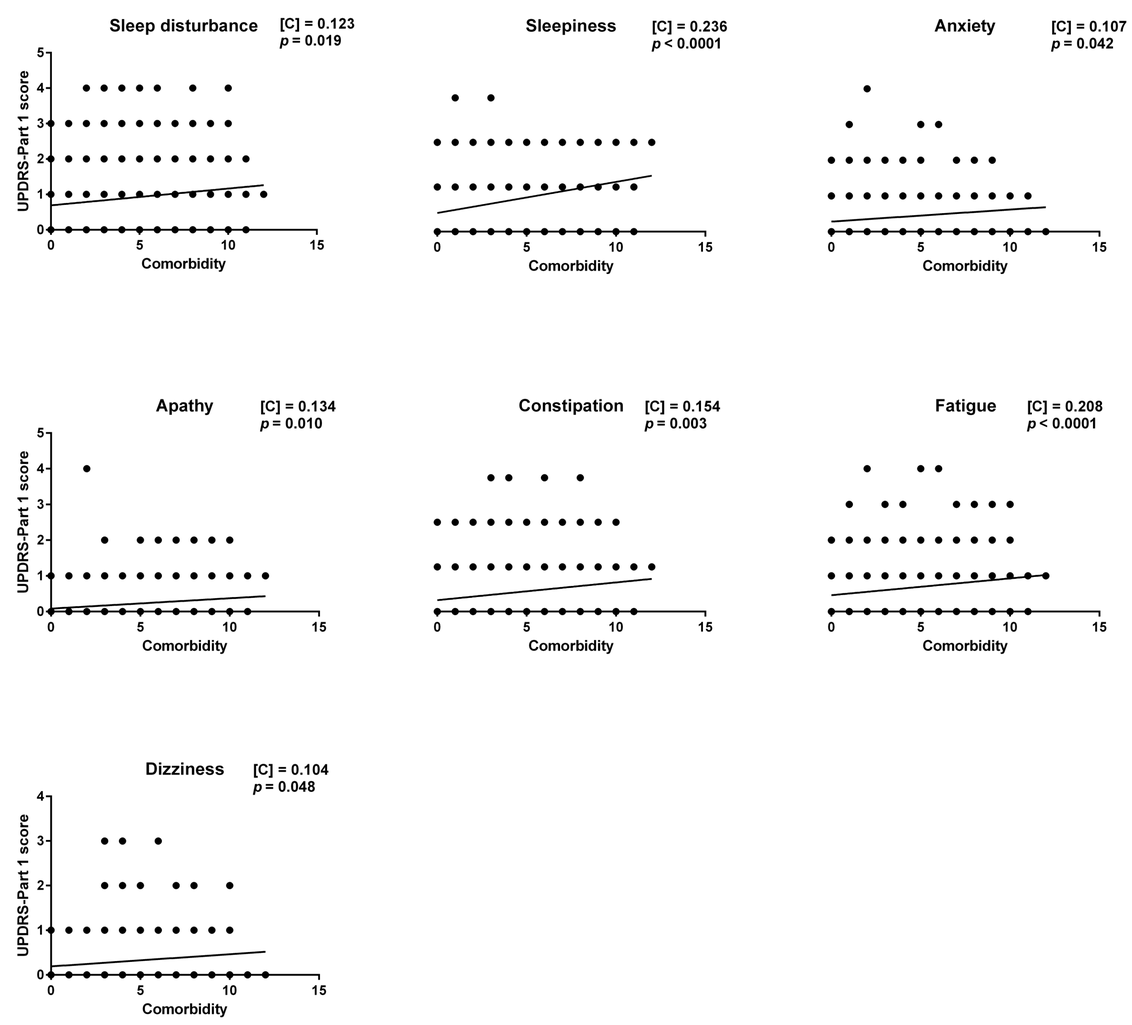


x axis: 1 = patients who had 0-1 comorbidities, 2 = patients who had 2-4 comorbidities and 3 = patients who had 5 or more comorbidities.

RESULTS

Thirty-six PD patients had 0-1 comorbidity, 162 had 2-4 and 168 had ≥5. Compared to those who had 0-1 or 2-4 comorbidities, PD patients with ≥5 comorbidities were significantly older (p=0.003 vs 0-1; p=0.006 vs 2-4) with a longer disease duration (p=0.05 vs 0-1; p=0.006 vs 2-4) and exhibited higher burden of non-motor symptoms (MDS-UPDRS part 1, p=0.011 vs 0-1; p=0.027 vs 2-4) and autonomic dysfunction (SCOPA-AUT, p=0.005 vs 0-1; p=0.001 vs 2-4). Among non-motor symptoms, comorbidity was correlated with anxiety (Pearson's Correlation [C]=0.107, p=0.042), apathy (C=0.134, p=0.010), sleep problems (C=0.123, p=0.019), sleepiness (C=0.236, p<0.0001), constipation (C=0.154, p=0.003), dizziness (C=0.104, p=0.048), and fatigue (C=0.208, p<0.0001). There was no difference in motor burden (MDS-UPDRS part 3, H&Y stage), nigrostriatal dysfunction or any CSF biomarkers between comorbidity groups.

Figure 2 Correlations between comorbidity burden and non-motor symptoms



CONCLUSION

Our findings demonstrate that increased comorbidities in PD patients is related to higher burden of non-motor symptoms and autonomic dysfunction. We show that PD patients with 5 or more comorbidities have a longer disease duration and are significantly older. We also illustrate that anxiety, apathy, sleep disturbances, constipation, dizziness and fatigue are strongly associated with comorbidity, suggesting that comorbidity negatively influences non-motor symptom burden, therefore impacts significantly on the quality of life of these patients. Our study highlights the detrimental impact of health comorbidities on PD patient's non-motor symptoms. The greater the number of comorbidities, the higher the risk of adverse outcomes including disability, increased health care costs, institutionalization, and morbidity. Therefore, early identification of non-motor symptoms and suitable interventions is pivotal for the effective care of patients with PD.

References

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