Autonomic dysfunction causes disability in Parkinson disease: a prospective study

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BACKGROUND

Dysautonomia represents a frequent but still underrecognized feature of Parkinson disease (PD)[1], with a detrimental effect on patients' disability[2]. What remains to be clarified is how the rate of progression of dysautonomia is independently related to the worsening of activities of daily living (ADL) and quality of life (QoL).

OBJECTIVES

To evaluate the extent to which progression of dysautonomia in PD impairs ADL and QoL and the effect of orthostatic hypotension (OH) on clinical disability, falls and health care utilization.

MATERIALS AND METHODS

We recruited 131 PD patients into a 12-month, prospective, observational cohort study. Clinical measures included the Movement Disorder Society-Unified Parkinson's Disease Rating Scale (MDS-UPDRS), Scale for Outcomes in PD-Autonomic (SCOPA-AUT) (total score and different autonomic domains), and orthostatic blood pressure measurements. Dysautonomia was defined as impairment in more than one autonomic domain. Worsening of autonomic symptoms was defined as ≥ 1 increase in the SCOPA-AUT score during follow-up.

RESULTS

After 12 months, complete data were available for 122 patients. The overall severity of autonomic symptoms worsened by 20% during follow-up, with SCOPA-AUT changing from 12.85 ± 8.52 to 15.38 ± 9.22. ($p<0.001$). Gastrointestinal symptoms deteriorated in 51.6% of patients, urinary/sexual in 59.0%, thermoregulatory in 45.1%, cardiovascular in 29.5%, and pupillomotor in 11.5%. The prevalence of OH increased from 31.1% to 46.7% ($p<0.001$), of which 38.6% were asymptomatic.

After adjusting for disease duration, cognitive impairment, and motor severity, worsening of autonomic symptoms was associated with deterioration in ADL (OR:2.1; $p=0.028$) and QoL (OR:2.9; $p=0.015$). The association between the worsening of autonomic domains and ADL deterioration or QoL impairment is summarized in Table 1.

Compared to patients without OH (Figure 1), symptomatic OH resulted in a 4-fold higher risk of ADL deterioration, a 7-fold higher risk of QoL deterioration, a 7-fold higher risk of falls and a 6-fold higher risk of higher utilization of health care. Asymptomatic OH resulted in a 5-fold higher risk of ADL deterioration, a 3-fold higher risk of QoL deterioration, a 6-fold higher risk of falls and a 12-fold higher risk of higher utilization of health care ($p\leq0.002$). The presence of concurrent SH did not yield any effect on ADL or QoL.

CONCLUSIONS

Autonomic symptoms severity progression and OH (even if asymptomatic) independently worsened ADL and QoL, confirming that dysautonomia is an important determinant of functional disability [2,3].

	ADL Deterioration		QoL Deterioration	
	Odds Ratio (95% CI)	P	Odds Ratio (95% CI)	P
SCOPA-AUT Total Score	2.193 (1.096-4.780)	**.028**	2.967 (1.230-7.154)	**.015**
Gastrointestinal domain	2.050 (1.050-4.556)	**.042**	3.210 (1.400-7.362)	**.006**
Urinary-sexual domain	1.377 (0.619-3.063)	.434	2.227 (1.080-5.057)	**.046**
Cardiovascular domain	1.332 (0.545-3.259)	.530	3.763 (1.492-9.490)	**.005**
Thermoregulatory domain	1.623 (0.718-3.669)	.245	3.205 (1.391-7.388)	**.006**
Pupillomotor domain	3.235 (0.663-5.795)	.147	2.015 (0.975-3.817)	.098

Table 1. Impact of autonomic symptoms on deterioration of activities of daily living and quality of life *(data adjusted for disease duration, MoCA and MDS-UPDRS-III scores modification)*

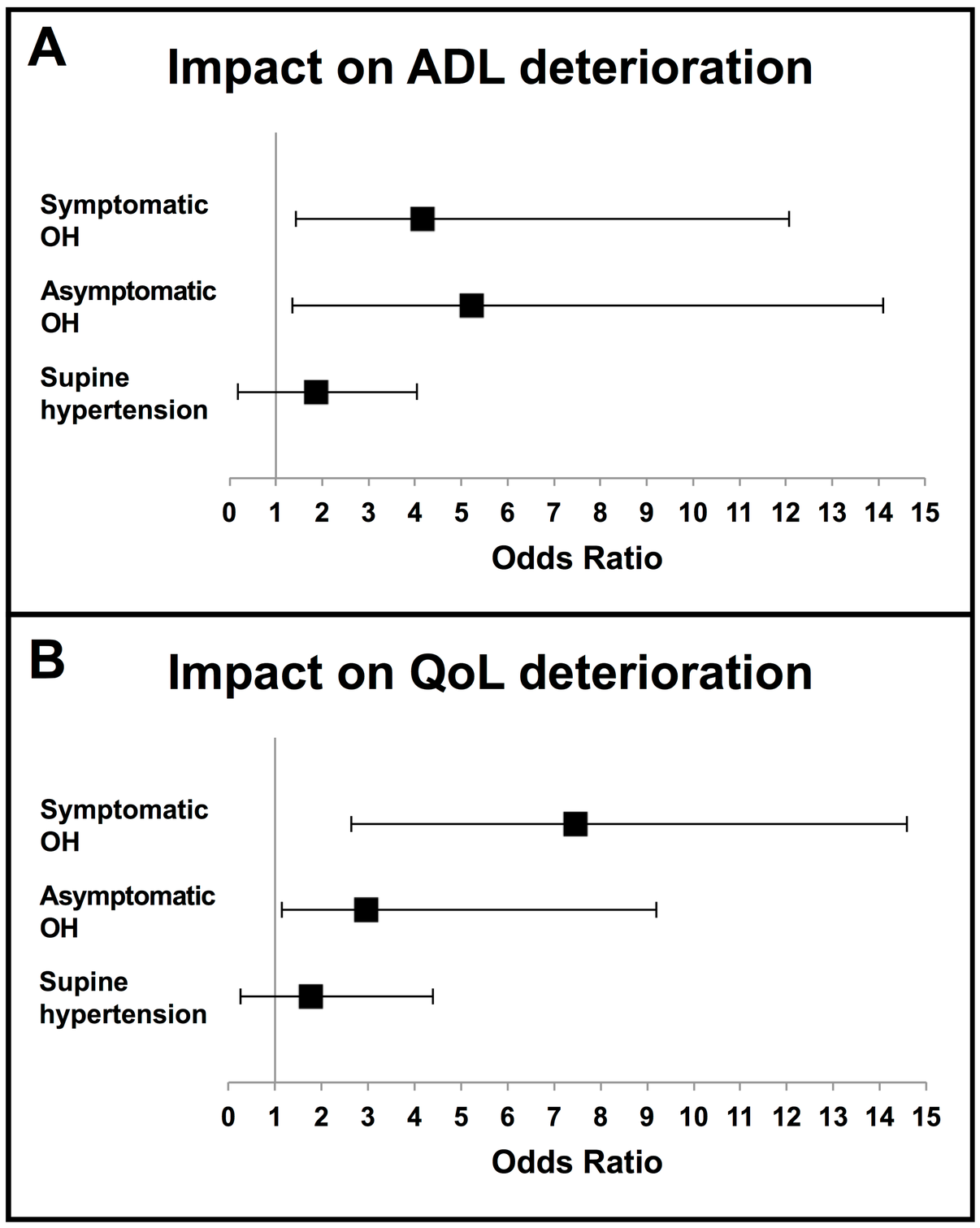

Figure 1. Impact of symptomatic/asymptomatic orthostatic hypotension and supine hypertension on ADL and quality of life *(data adjusted for disease duration, MoCA and MDS-UPDRS-III scores modification)*

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