Übersicht HRV – Parkinson

Autonomic dysfunction in dementia.

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BACKGROUND: There are no studies of autonomic function comparing Alzheimer's disease (AD), vascular dementia (VAD), dementia with Lewy bodies (DLB) and Parkinson's disease dementia (PDD). AIMS: To assess cardiovascular autonomic function in 39 patients with AD, 30 with VAD, 30 with DLB, 40 with PDD and 38 elderly controls by Ewing's battery of autonomic function tests and power spectral analysis of heart rate variability. To determine the prevalence of orthostatic hypotension and autonomic neuropathies by Ewing's classification. RESULTS: There were significant differences in severity of cardiovascular autonomic dysfunction between the four types of dementia. PDD and DLB had considerable dysfunction. VAD showed limited evidence of autonomic dysfunction and in AD, apart from orthostatic hypotension, autonomic functions were relatively unimpaired. PDD showed consistent impairment of both parasympathetic and sympathetic function tests in comparison with controls (all p<0.001) and AD (all p<0.03). DLB showed impairment of parasympathetic function (all p<0.05) and one of the sympathetic tests in comparison with controls (orthostasis; p = 0.02). PDD had significantly more impairment than DLB in some autonomic parameters (Valsalva ratio: p = 0.024; response to isometric exercise: p = 0.002). Patients with VAD showed impairment in two parasympathetic tests (orthostasis: p = 0.02; Valsalva ratio: p = 0.08) and one sympathetic test (orthostasis: p = 0.04). These results were in contrast with AD patients who only showed impairment in one sympathetic response (orthostasis: p = 0.004). The prevalence of orthostatic hypotension and autonomic neuropathies was higher in all dementias than in controls (all p<0.05). CONCLUSION: Autonomic dysfunction occurs in all common dementias but is especially prominent in PDD with important treatment implications.

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Cardiovascular dysautonomia in de novo Parkinson's disease.

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BACKGROUND: Clinical symptoms of Parkinson's disease (PD) include not only motor distress, but also autonomic dysfunction. OBJECTIVE: To clarify the progression of autonomic nervous dysfunction in PD. METHODS: The subjects were 44 patients with de novo PD. Autonomic nervous function, including cardiac sympathetic gain, was evaluated on the basis of cardiac radioiodinated metaiodobenzylguanidine (MIBG) uptake, the response to the Valsalva maneuver, and spectral analyses of the RR interval and blood pressure. RESULTS: Decreased cardiac MIBG uptake was found even in patients with early stage PD. MIBG uptake gradually decreased with increased disease severity. Hemodynamic studies using the Valsalva maneuver revealed that patients with early stage PD had reduced baroreceptor reflex sensitivity (BRS) in phase II, but not phase IV. Blood pressures normally rose in phases II and IV, but the increments decreased with disease progression. In early stage PD, the low frequency power of the RR interval (RR-LF) and the ratio (LF/HF) of RR-LF to the high frequency component of the RR interval (RR-HF) were significantly lower than the respective control values, despite no significant difference in RR-HF; these variables
Frequency and predictors of autonomic dysfunction in Parkinson's disease: a study of African patients in Lagos, Nigeria.

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The degenerative changes in PD also affect the autonomic nervous system. The frequency and predictors of such involvement in Africans with PD has not been reported. **OBJECTIVE:** i) To determine the frequency and type of autonomic dysfunction in Nigerians with idiopathic Parkinson's disease (PD). ii) To determine the predictors of autonomic dysfunction in PD.

**METHODS:** Cardiovascular autonomic function assessed in 33 study subjects with PD and 33 age-matched controls, utilising heart rate variability to deep breathing, standing and the Valsalva manoeuvre, and the blood pressure (BP) response to standing. The results were compared based on treatment category, grade of severity on the Columbia scale of Hoehn and Yahr, duration of PD, age at onset of PD, present age and occurrence of autonomic symptoms.

**RESULTS:** Parasympathetic function was abnormal in 51.5% of PD subjects, significantly higher than controls (P<0.001). Of these, 76.5% had early parasympathetic involvement and 23.5% definite parasympathetic involvement. Age above 65 years (at time of study or onset of PD) was the only clinical variable associated with parasympathetic autonomic dysfunction (p<0.05). Symptoms dysfunction occurred in 60.6% of PD patients and only 6.1% of controls (p<0.01). There was however no demonstrable relationship between the occurrence of symptoms and objective evidence of autonomic dysfunction: 41.2% of PD patients with parasympathetic dysfunction had no symptoms. **CONCLUSION:** Autonomic dysfunction was found to be common in Africans with PD, particularly those above 65 years and tends to affect the parasympathetic system. However, the abnormality may be detectable even before symptoms appear. As such, we recommend that cardiovascular tests of autonomic function be a routine aspect of the evaluation of PD patients, especially with advancing age.

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Nocturnal cardiac autonomic regulation in Parkinson's disease.

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Diminished heart rate (HR) variability has been reported in patients with early phase Parkinson's disease (PD) using standardized cardiovascular reflex tests. However, limited data exist on HR variability during sleep; thus the present study was performed to investigate the characteristics of HR variability during different sleep stages. The HR variability of 21 newly diagnosed and untreated PD patients and of 22 control subjects was evaluated by using time domain, frequency domain and non-linear methods and by analyzing HR reactions to body movements during the different sleep stages (non-REM stages S1-4 and the REM stage). The
nocturnal cardiac autonomic control was disturbed in PD patients compared to controls both during sleep and waking. HR reactions to body movements were decreased especially during REM sleep referring to defective sympathetic cardiovascular control. High frequency spectral power of HR variability was attenuated in the patients in waking and during non-REM sleep but not during REM sleep suggesting that parasympathetic cardiovascular control is also affected in early PD. **However, the variance of R-R intervals during non-REM sleep was significantly increased in PD patients. Especially during this sleep stage the patients also moved more than the controls.** HR variability is decreased not only in waking but also during sleep in PD patients. However, the increased variance of HR during non-REM sleep refers that in early phase of PD cardiovascular system is still able to react to changing body circumstances. **Furthermore, our findings suggest that the indicators measuring the dominant sympathetic or parasympathetic activity of each given sleep stage are the most sensitive measures in revealing disturbed nocturnal ANS function.**

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Heart rate variability and Parkinson's disease severity.

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Heart rate variability (HRV) decrease in Parkinson's disease (PD) could only be a consequence of reduce motor activity besides of being a marker of cardiovascular dysautonomia. Under continuously recorded and standardised motor activity, we studied thirty patients compared to controls in 3 PD stages: group I: less than 2 year-evolution, slight impaired without L-dopa; group II: mildly impaired with L-dopa; group III: advanced PD with motor complications. No difference was observed between group I and controls. The diurnal low frequency power (LF) and the ratio of LF/high frequency (HF) power decreased in groups II and III. The nocturnal vagal indicators: HF power and pNN50 were decreased in group III. Those parameters were correlated with Off-drug-motor handicap, suggesting an evolutive HRV decrease with disease severity but not with On-drug-motor activity. The low LF despite the higher motor activity in group III, due to dyskinesias, suggested a defective cardiovascular up-regulation.

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Circadian heart rate variability in Parkinson's disease.

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Department of Neurology, University of Oulu, P. O. Box 5000, 90014 Oulu, Finland. Parkinson's disease is known to affect the reflex cardiovascular control systems, resulting in a suppressed heart rate variability, but present knowledge concerning the long-term characteristics of heart rate and heart rate variability, e.g. circadian regulation, is limited. We investigated the circadian fluctuation of the time domain, frequency domain and some non-linear measures of heart rate variability in 44 untreated patients with Parkinson's disease and 43 age- and sex-matched control subjects. In the parkinsonian patients, the measured power
spectral components of heart rate variability (low-frequency power and high-frequency power) and the SD(1) value of the Poincaré two dimensional vector analysis, that quantifies the short term beat-to-beat variability, were suppressed at night. During the daytime only the SD1 of the Poincaré was suppressed. The night-to-day-ratios of the heart rate variability measures did not differ significantly between the patients and the controls. The results indicate that the long-term parasympathetic cardiovascular regulation is impaired in untreated patients with Parkinson's disease. The dysfunction is more pronounced at night.

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