Premotor PD: autonomic failure
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Non-motor symptoms in PD
- Autonomic
  - OH, constipation, impotence, urinary incontinence or retention, hyperhidrosis
- Hyposmia
- Sleep
- Cognitive deficits
  - Executive dysfunction, MCI, dementia
- Psychiatric deficits
  - Depression, psychosis, anxiety, apathy
- Other
  - Pain

NMS in PD
Extranigral pathology

Lim & Lang 2009
ILBD: PANS Involvement  
Bloch et al. 2006

Autonomic failure in premotor PD  
Autonomic failure as the initial presentation of Parkinson disease and dementia with Lewy bodies  
Therap Kachman, MD, Korea Na, MD, Jawad Pervez, MD, and David St. J. 2004

Premotor PD: Cardiovascular dysfunction

1. Orthostatic hypotension (OH)
2. Chronotropic insufficiency
3. Heart rate variability
4. Cardiac sympathetic imaging

Palma & Kaufmann 2014
Orthostatic hypotension
- Consensus criteria (Freeman et al 2011) -

1. Abnormal blood pressure drop (∆ 20/10) within 3 minutes of standing or tilt

2. Abnormal blood pressure drop (∆ 20/10) after 3 minutes of standing or tilt = delayed OH

OH Symptoms
Cerebral hypoperfusion:
- Light-headedness
- Dizziness
- Visual disturbances
- Loss of consciousness
- Impaired cognition

Muscle hypoperfusion:
- Coat-hanger ache
- Gluteal ache
- Calf ache

Renal hypoperfusion:
- Oliguria

Non-specific:
- Fatigue

Modified from Mathias 1999

Early / premotor PD-OH

2003 Orthostatic Hypotension in De Novo Parkinson Disease
Emilia Borroni, MD; Claudia Luconi, MD; Ilaria Del Cisma, MD; Fabiana Giordano, MD; Grazia Gardini, MD; Massimo Bernardini, MD; Monica Bassi, MD; BO; Alberto Prag, MD
14% (7 / 51)

2006 Orthostatic hypotension as an early finding in Parkinson's disease
Davide S. Galaverna
Early 60% (21 / 35)
Premotor 11% (4 / 35)
Prodromal autonomic features in PD & DLB
Postuma et al 2013

- Prospective cohort study
- 14-year follow-up
- > 5000 adults aged ≥ 65 years
- Premotor OH in 18% of 214 incident PD cases
- OH in 18% of non-PD controls

No evidence of premotor OH

Premotor OH
RESEARCH ARTICLE
MDJ 2012

Cardiovascular Physiology in Premotor Parkinson's Disease: A Neuropathologic Study

- Chronotropic insufficiency
- MDJ 2013
- Retrospective cohort study
- 2539 patients without neurological disease
- Cardiac stress testing at baseline
- 18 incident PD cases within 4 years
- Blunted heart rate compared to non-PD cohort

Chronotropic insufficiency: a sign of cardiac sympathetic denervation?
Heart rate variability

1. HRV parameters are reduced in PD and iRBD (Valappil 2010, Palma 2013)
2. BUT Prospective studies failed to prove a predictive value (Postuma 2010, Jain 2012, Palma 2013)

- number of incident PD too small
- only linear HRV parameters used

Cardiac sympathetic denervation

- Kashihara 2006, Orimo 2008 -

Cardiac sympathetic denervation identifies premotor PD?
Premotor PD: autonomic failure

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50 patients, 66 yrs, DD 2 yrs, HY 1.9
Urinary storage symptoms 64%, voiding symptoms 28%
Urodynamics: detrusor overactivity 58%, underactivity 50%
Few patients with urge incontinence
No sphincter EMG abnormalities

No correlation with gender, disease severity or motor type
Conclusions

- Autonomic failure is an early feature of PD
- No single autonomic feature accurately predicts PD
- Low specificity of some autonomic features
- Identification of autonomic features to be improved
- No premotor data for some autonomic features such as sweating disorder