The Movement Disorder Society-Non-Motor Scale (MDS-NMS):
Results From the Initial Phases of an International Validation
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OBJECTIVES: To revise the Non-Motor Symptom Scale (NMSS) and develop a new up to date version:
1. Consolidation, refinement and improvement in wording and scoring, including the anchors and scoring for each item
2. Clearer grouping of individual items into disorders or domains
3. Inclusion of symptoms/disorders not covered or covered in a limited fashion in the NMSS (e.g., multi-domain cognitive impairment, impulse control and related disorders (ICDs), non-motor fluctuations (NMFs), fatigue as a distinct syndrome, and some dysautonomia symptoms)
4. Ensuring that the instrument is appropriate for use as global NMS measure in future clinical trials

BACKGROUND
- A significant advancement in the recognition and study of NMS in Parkinson’s disease (PD) was the development of
  o the NMS questionnaire (NMSS)⁴
  o the Non-Motor Symptoms Scale (NMSS)²,³
- NMSS is increasingly used in clinical trials, e.g. RECOVER (UCB), DUOGLOBE (Abbvie), PANDA (Mundipharma), TOLEDO (Britannia)
- WHY DO WE NEED NEW NMSS?
  - To keep pace with the extensive developments that have taken place in the field of PD NMS since 2007 when NMSS was validated
  - In the UPDRS and MDS-UPDRS each NMS disorder(s) is covered by a single item only with a 5-point rating, which provides limited data

METHODS
Phase 1: A preliminary version of MDS-NMS (pvMDS-NMS) was developed including 15 domains with 63 items, each one scoring for:
- frequency (0 - 4)
- severity (0 - 4)
- a total score (frequency x severity; 0 - 16)
A higher score on an item indicates more severe symptoms
Additionally, the scale includes an optional section for evaluating non-motor fluctuations (NMF) in 7 domains, scored 0 - 4 for each item (change from “on” to “off” period).
Phase 2: A pilot study (UK and USA) was performed in 69 non-demented PD patients and 19 healthy controls by 20 experienced neurologists using the neurologist-based pvMDS-NMS and questionnaires about the MDS-NMS for neurologists, patients and controls. Statistical analysis assessed data quality, missing values, scores distribution, and preliminary reliability. Both phases have been completed.

RESULTS
- The pvMDS-NMS scores were fully computable in 95.64%.
- Total mean score (±SD) in PD patients was 91.6 ±100.5 (range: 10 - 491).
- All domains except Sleep and Wakefulness (7.2%) showed floor effect (low endorsement of symptoms) >15% (22.1 – 79.7%), but none had relevant ceiling effect (high endorsement of symptoms) (1.4 – 4.5%).
- Cronbach’s alpha index was satisfactory for 9/15 domains.
- Inter-item and Item-total correlations were globally satisfactory, and the item homogeneity index (standard value, >0.30) was satisfactory for most domains, except for: (1) Impulse control and related disorders, (2) Other Neuropsychiatric symptoms, and (3) Other Symptoms
- The optional NMF section was completed by 71%, with similar findings in score distribution to the main pvMDS-NMS.

CONCLUSIONS:
The pvMDS-NMS showed satisfactory basic clinimetric attributes of the scale while some items and domains performed suboptimally. The definitive version of the MDS-NMS is now to be validated.

REFERENCES
³P Martinez-Martín et al., Neurology 2009; 73: 1584–1591

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