Symptom Clusters in Individuals with Parkinson’s Disease with Motor Fluctuations

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BACKGROUND

Parkinson’s Disease (PD) manifests with a multitude of motor and non-motor features compounded by intra-individual fluctuation, which makes diagnosis and management of specific PD manifestations challenging. There are clear indications that demographics, including age of onset, sex, and neuropsychological factors influence the expression of PD symptoms. Knowledge of which patients are more likely to manifest specific symptom clusters could improve individualized intervention and management and may be considered in clinical trial design.

OBJECTIVES

Identify symptom clusters in a large group of PD patients who experience fluctuations in symptoms.

Examine the relationship of symptom fluctuations with age, age at PD onset, and gender.

METHODS

Cross-sectional online questionnaire administered to the Fox Insight Study cohort. Fox Insight (FI) is an online observational study that includes individuals with self-reported PD (status as of 1/1/2019).

Sample criteria for survey participation:

- Enrolled in the PD cohort of Fox Insight based on self-report of PD diagnosis.
- On levodopa therapy.
- OF 3393 eligible FI participants, 2981 invited the survey, 2107 completed experiencing O/F periods in which symptoms are not controlled.

The Thirteen-Wearing Off Questionsnaire (WOQ-13) was administered. It presents 13 symptoms and asks patients to indicate presence or absence of each symptom “once a day recently,” then asks if each symptom alleviated or remains the same after taking levodopa (Medication response/MS).

233 participants endorsed ≥12 symptoms on the WOQ-13 and were excluded outliers. The final sample considered in this analysis was n=1074.

A latent class analysis (LCA) fit using polCA package in R was estimated for 2 to 5 classes. Thirteen, brain-latitude, and rigidity are core features of PD, and any attempts to include them defined one model that was then attempted using varying models to vary on 10 of the 14 questions from the WOQ-13 questionnaire as latent class indicators (Skrabut & Skrabut, 2016). A class model was optimal fit. Each model was examined 10 times with different starting values in order to find the global maximum for class membership probabilities.

RESULTS

Table 1. Symptom clusters and characteristics of subjects in each class: unique symptom clusters were those symptom clusters to occur in >50% of any single class.

![Figure 1. Heat map depicting proportion with symptoms based on age and sex in each class.](image)

Table 2. The predicted and observed proportion of symptoms and proportion of those symptoms that were reported to be medication-responsive in the example submitted by their predicted class membership. Median, error, movement, and et-A5 were excluded from the LCA (gray scale).

CONCLUSION

Our findings illustrate motor and non-motor symptom clustering in PD and demographic differences in this regard.

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