Quantitative Home-based Assessment of Parkinson`s Symptoms: feasibility and usability study


Clinical Pharmacology Unit, Instituto de Medicina Molecular
JIFERREIRA Lab

Background

• **Assessment of symptoms** associated with PD is currently performed mainly in the clinic and don’t reflect daily life situations.

• These assessments have relevant shortcomings because they provide only a snapshot of the condition.

• New assessment strategies are needed allowing real-time monitoring of symptom changes.
Framework

Objective

Assess feasibility and usability of an objective, continuous and relatively unobtrusive system in PD patients, consisting on a device of four components:

- 3 wearable sensors worn during the day and one worn at night;
- Smartphone App;
- Wii balance board;
- Computer software.
Method

Inclusion criteria:
- Between 40 and 85 years of age;
- Stage 1 to 2.5 (ON) of H&Y;
- Having experience or interest in technical equipment (computer, regular mouse and keyboard) to enter the users groups.

Exclusion criteria:
- Illiteracy;
- MMSE ≤ 24;
- Postural instability item MDS-UPDRS > 2;
- Inability to handle the device for some other reason.

• A multi-centre (Portugal, Norway and Germany), open-label study;
• 22 PD patients were tested 24/7 over 12 weeks:
  ➢ 11 Users: performed clinical assessments every other week and used the SENSE-PARK system;
  ➢ 11 Non-Users: only completed the clinical assessments.

Clinical domains: Gait, Bradykinesia, Tremor, Sleep, Sway and Cognition.
Method

Outcomes

**Primary outcome:**
- Compliance with and usability of the device (number of completed visits, tasks performed).

**Secondary outcomes:**
- Information obtained from the CRF to evaluate the usability of the system
- Success of data transfer
- Patient satisfaction and preference: Post-Study System Usability Questionnaire (PSSUQ) score
- Problems that arise from using this device (pain, irritability, stress)
- Withdrawal from the study
Results

- Most participants **liked using** the system and valued that it **signaled changes in their health condition**.

![Bar chart showing percentage of participants](chart1.png)

- **All patients completed** the study.
- The participants rated the usability of the SENSE-PARK system with a mean score of **2.67 (±0.49)** on the **PSSUQ**.

![Graph showing mean values of PSSUQ](chart2.png)
Conclusions

• All subjects completed the 12 weeks controlled study and most subjects completed the tasks asked.

• Overall subjects were satisfied with the device (PSSUQ - mean value: 2.67).

• No major adverse events were related to the study and no withdrawals from the study. Doubts and difficulties decrease during the study.

• Motivation to wear such a system can be increased by providing direct feedback about the individual health condition.

• Particular emphasis should be given to a user-friendly design.

Thank You