

RELIABILITY OF A NEWLY DEVELOPED PROTOCOL FOR FIBEROPTIC ENDOSCOPIC EVALUATION OF SWALLOWING IN PARKINSON'S DISEASE

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BACKGROUND

- Dysphagia as a frequent and clinically relevant symptom of Parkinson's disease (PD) is leading to various threats to health and reduction in quality of life.
- Although the penetration-aspiration scale has become a standard for fiberoptic endoscopic evaluation of swallowing (FEES), it fails to identify beginning oropharyngeal symptoms.

OBJECTIVE

- A new protocol for FEES specified for dysphagia diagnosis among PD patients (PARK-FEES) was recently developed in a prior study among 142 PD patients Ref¹, which is now aimed to be investigated for inter-coder agreement. Tab 1

Table 1 PARK-FEES study phases

Phase I – Development PARK-FEES	
Part 1 – FEES protocol construction, N=20*	
Step 1 – Parameter generation for symptom scales, incl. gold standard	
Step 2 – Modification of generically scales / scales for other diseases, and specification on PD	
Part 2 – Pilot study, N=45**	
Step 1 – Feasibility of preliminary PARK-FEES protocol	
Step 2 – Scales modification (19 parameters)	
Part 3 – Main study, N=77**	
Step 1 – Application of final PARK-FEES protocol	
Step 2 – Content and construct validity test	
Step 3 – German to English translation	
Phase II – Re-evaluation PARK-FEES	
Part 1 – Inter-coder agreement study, N=77***	
Step 1 – Independent offline evaluation of FEES video recordings from main study using PARK-FEES by two FEES experts	
Step 2 – Interrater reliability analyses (all three coders & two a posteriori evaluations only)	
Part 2 – Result evaluation (in progress)	
Step 1 – Definition of overall severity classification (score algorithm)	
*healthy relatives of PD patients, comparison with standard values	
**patients diagnosed with PD, according to UK Brain Bank criteria	
***video records of PD patients from main study	

REFERENCE 1 Simons JA, et al. Development and validation of a new screening questionnaire for dysphagia in early stages of Parkinson's disease. Parkinsonism Relat Disord 2014; 20(9): 992 – 998

DISCLOSURE Nothing to report.



METHODS

- FEES video recordings from 77 PD patients at a German Movement Disorder Center (w/o pre-existing dysphagia, aged 70.47 +/- 8.40 (mean, SD), disease duration 11.19 +/- 6.27 y., median Hoehn & Yahr stage 3) previously evaluated with the new PARK-FEES protocol were re-evaluated independently from 2 experts.
- PARK-FEES contains 10 ordinal parameters to describe early and advanced dysphagia symptoms typically occurring in PD. Tab 2

Table 2 Parameters of PARK-FEES protocol

Parameters (inspection of structure, sensory-reflex-analyses, functional exam, swallowing tests)*	Scale **†
1. Secretion management	0–4 (0=normal)
2. Vocal cord motility (i:l) phonation)	0–2 (0=normal)
3. Glottal closure (tightly breath-holding)	0–2 (0=normal)
4. Voluntary cough impact	0–2 (0=normal)
5. Bolus leakage (H2O, BREAD, COOKIE)	0–4 (0=normal) each, typical & max performance
6. Residues (H2O, BREAD, COOKIE, TABLET, PILL)	0–3 (0=normal) each, typical & max performance
7. Clearance effectiveness (H2O, BREAD, COOKIE, TABLET, PILL)	0–4 (0=normal) each, typical & max performance
8. Leakage afterwards (H2O, BREAD, COOKIE)	0–4 (0=normal) each, typical & max performance
9. Penetration aspiration scale (PAS) (H2O, BREAD, COOKIE)	1–8 (1=normal) each, typical & max performance
10. Type of penetration/aspiration: pre-, intra-, post-deglutitive (H2O, BREAD, COOKIE)	0–3 (0=normal) each, typical & max performance

* Test instructions were standardized and performed in medication on state condition. Swallowing samples: 90ml spring water (dyed blue), half slice of bread with crust and spread (approx. 8*7*1 cm), German butter chocolate cookie (diameter 5 cm), divisible uncoated ProLife VitaFit tablet (approx. 19*8*7 mm), uncoated Hepa Lichtenstein placebo pill (diameter 5mm)
** Underlying verbal symptom explanations to describe the severity level for each item. Evaluations were done for typical swallowing performances as well as for maximum outliers.

- Examination order was performed in a standardized procedure incl. anatomic-physiological exam, nutrition ingestion of 3 diff. consistencies, and medication samples.
- Score assessment was done twice in order to distinguish typical swallowing performance from possible outliers (maximum values).
- Interrater reliability was calculated for all parameters, and separately for each consistency using Krippendorff's Alpha (95% CI; bootstrapping 10k).

RESULTS

- 73% of patients presented with swallowing disabilities (44% oropharyngeal symptoms, 29% penetration/ aspiration).
- 12 of the 25 estimations achieved a Kalpa above the threshold of .60 indicating good inter-coder agreements when tested in all 3 observers' evaluations (original examination situation and both a posteriori ratings).
- Highest values resulted for "Clearance effectiveness PILL" (Kalpa= .89, CI .78-97), "Residues PILL" (.88; .73-1.00), and "Leakage afterwards BREADmax" (.81, .64-.96).

- Even more parameters can be outlined with excellent interrater reliability by comparing both posteriori observed evaluations pairwise.

CONCLUSIONS

- Using PARK-FEES enables clinicians to accurately characterize dysphagia symptoms and supports to differentiate early oropharyngeal from clinically advanced stages.
- Furthermore, it demonstrates a high level of interrater reliability.
- The next step is to define a score classification algorithm for overall assessment of dysphagia severity in order to facilitate interprofessional communication and appropriate treatment strategies.

