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Background

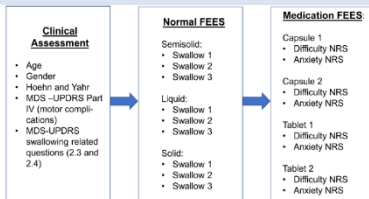
Dysphagia is common in PD and assumed to complicate medication intake. However, there are few studies which have systematically assessed dysphagia during medication swallowing and its relation to motor complications.

Objective

This study attempted to obtain a comprehensive picture of medication intake dysphagia in Parkinson's disease (PD). Specific investigations included 1) An objective, graduated and multidimensional classification of medication dysphagia in PD, 2) the association of medication dysphagia and motor complications, 3) the prevalence of medication dysphagia in relation to oral dosage form and normal bolus dysphagia and 4) predictors of medication dysphagia.

Methods

A classification of medication dysphagia was developed based on a retrospective analysis. In a prospective study, 66 PD patients then underwent flexible endoscopic evaluation of swallowing, which included swallowing of 4 dosage forms (small and large tablets [10-17mm length] and capsules [19 – 29mm length]).



FEES-Flexible Endoscopic Evaluation of Swallowing

NRS-Numeric Rating Scale

Results

- A two-dimensional, graduated, and reliable classification of medication dysphagia was introduced which differentiated between swallowing efficiency (impaired clearing, dissolution) and safety (risk of aspiration).
- Medication dysphagia predicted motor complications according to the MDS-UPDRS p-IV in a linear regression model. Swallowing efficiency, but not safety, differed by oral dosage form, with capsules tending to be swallowed more efficiently than tablets, irrespective of size.
- There was a moderate correlation between normal bolus dysphagia and medication dysphagia, although in individual cases, patients with severe medication dysphagia did not have normal bolus dysphagia.
- A score of ≥ 1 on the swallow-related MDS-UPDRS-items 2.3 and 2.4 can be considered as optimal cut-off for predicting medication dysphagia (sensitivity: 70.8%, specificity: 70.7%).

Classification of medication dysphagia

Ordinal level	Swallowing efficiency	Swallowing safety
0: No impairment	The medication is swallowed completely during the first swallowing attempt without dissolving.	The medication is swallowed without any risk of penetration or aspiration.
1: Mild impairment	The medication is not swallowed during the first attempt but is easily swallowed with additional attempts without dissolving.	The medication or water spills prematurely into the pharynx before swallowing or remains there prolonged after swallowing, but no penetration or aspiration occurs.
2: Moderate impairment	The medication is temporarily stuck in the oropharynx and can only be cleared with intensive swallowing attempts (≥ 5 attempts or additional water drinking) and/or there are minimal signs of dissolution (coating of the mucosa).	The medication or water penetrates into the laryngeal vestibule, but is effectively cleared by protective reflexes.
3: Severe impairment	The medication cannot be swallowed completely and partially dissolves.	The medication or water penetrates into the laryngeal vestibule, despite protective reflexes it is not cleared.
4: Very severe impairment	The medication cannot be swallowed at all and/or completely dissolves.	The medication or water penetrates into the laryngeal vestibule without attempts to clear it or is aspirated.

Demographics

Parameter	Value	Parameter	Value
Mean age \pm SD in years	68.4 \pm 8.8	Normal bolus OD, n (%)	
Gender m/f	44/22	No signs	20 (30.3%)
Hoehn & Yahr, n (%)		Mild	38 (57.6%)
2	29 (43.9%)	Moderate	5 (7.6%)
2,5	10 (15.2%)	Severe	3 (4.5%)
3	17 (25.8%)	Medication dysphagia, n (%)	
4	9 (13.6%)	No signs	22 (33.3%)
5	1 (1.5%)	Mild	20 (30.3%)
		Moderate	15 (22.7%)
		Severe	3 (4.5%)
		Very severe	6 (9.1%)

OD-Oropharyngeal Dysphagia

Conclusions

- Medication dysphagia is present in nearly 70% of PD patients and possibly predisposes to motor complications.
- Capsules, irrespective of size, tend to be swallowed more efficiently than tablets. Medication dysphagia should be evaluated independently of normal bolus dysphagia.
- The swallow-related MDS-UPDRS items may be used as screening parameters for medication dysphagia with moderate sensitivity and specificity.

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