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UMSARS-based evaluation of dysphagia assesses swallowing safety but not efficiency

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1/ Introduction

Multiple system atrophy (MSA): adult-onset, progressive neurodegenerative disorder, clinically characterized by various combinations of autonomic failure, parkinsonism and ataxia.¹

Dysphagia is frequent (31%–78%).²

Its presence within 3 years of disease motor symptom onset is listed among the supportive clinical features for MSA diagnosis.

The severity of swallowing disorders can be defined by the concept of “**swallowing safety**” (the ability to transfer the food bolus from the mouth to the stomach, without laryngeal penetration or inhalation in the lower airways) and the concept of “**swallowing efficiency**” (the ability to transfer the food bolus from the mouth to the stomach without oral/pharyngeal residue after swallowing).

Swallowing assessment is usually performed in neurological practice by movement disorder specialists by means of the **Unified Multiple System Atrophy Rating Scale (UMSARS) part I (item 2)**.³

Noteworthy, laryngoscopy as part of the ENT examination can inform on complete oro-pharyngo-laryngeal function.⁴

2/ Aim

The main objective of this study was to determine the correlation between the UMSARS part I item 2 score with an ENT assessment in the assessment of swallowing severity.

3/ Material and methods

Study Protocol and Patient Criteria

Single-center Retrospective Study

On 301 MSA patients, part of the French MSA cohort⁵ enrolled at the Toulouse site of the French MSA Reference Centre between January 2008 and March 2021,

Inclusion criteria were:

- a diagnosis of probable or possible MSA;
- an ENT examination in the voice and swallowing unit by an experienced ENT physician, within 100 days after or before the UMSARS assessment.

Data Collection

Each patient was assessed by a standardized swallowing assessment, consisting of a Fiberoptic evaluation of swallowing (FEES) and/or a videofluoroscopy of swallowing (VFS). Swallowing disorders were characterized by:

- clinical severity,
- presence (yes/no) of choking/laryngeal penetration,
- presence (yes/no) of an airway protective mechanism,
- the presence (yes/no) of an oral transit defect,
- presence (yes/no) of a pharyngeal transit defect.

Statistical Analysis

The data were analysed using XLStat software, version 2021.2.2.

Comparisons of the distribution of the UMSARS part I item 2 score severity (from 0 to 4) vs. the ENT clinical severity (mild, moderate, and severe) were performed by means of Chi-squared test and Fisher's exact test for qualitative variables, as appropriate. In case of a global statistically different distribution, pairwise comparisons were done for each UMSARS part I item 2 score group by means of the Fisher's exact test, with Holms-Bonferroni correction applied to multiple comparisons.

4/ Results

75 patients were included.

- Female 58,6%
- Age at ENT assessment: 63.6 y mean (8 SD).
- 70.7% of MSA-P and 29.7% of MSA-C.

Distribution of the swallowing assessment features stratified on UMSARS part I item 2

Fig. 1A: The ENT assessment indicated more severe swallowing impairment compared to the UMSARS part I item 2 score (p 0.003)

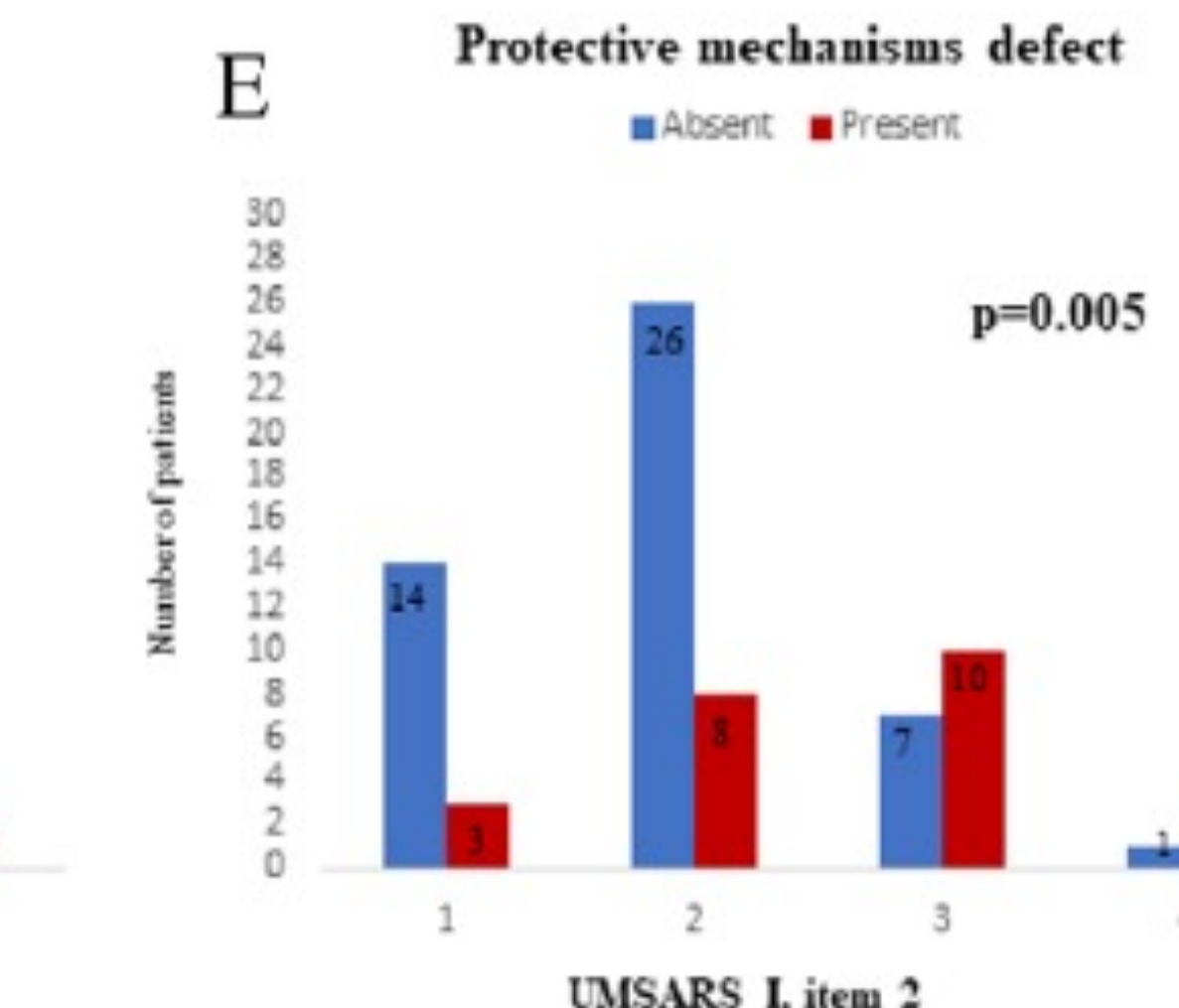
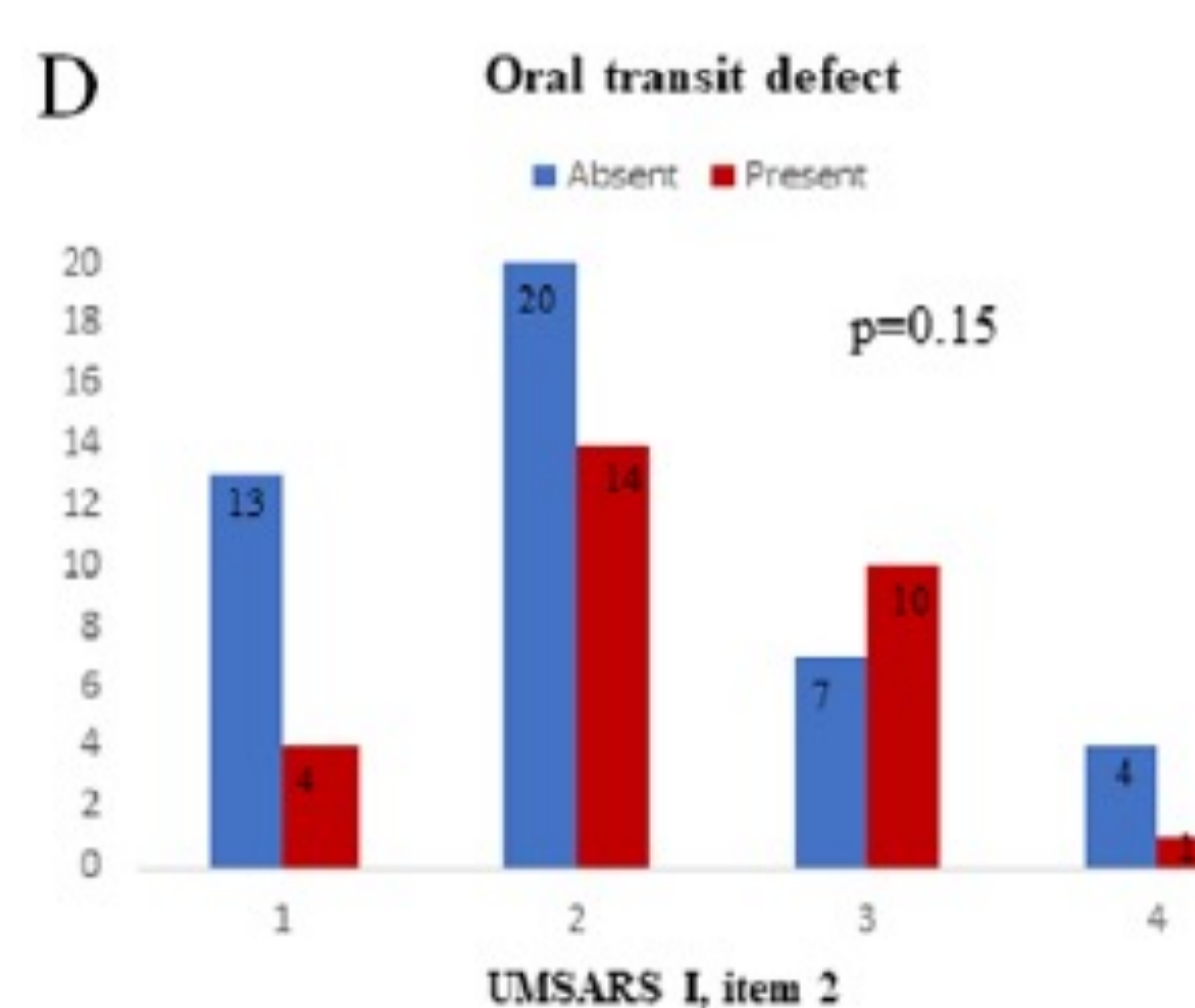
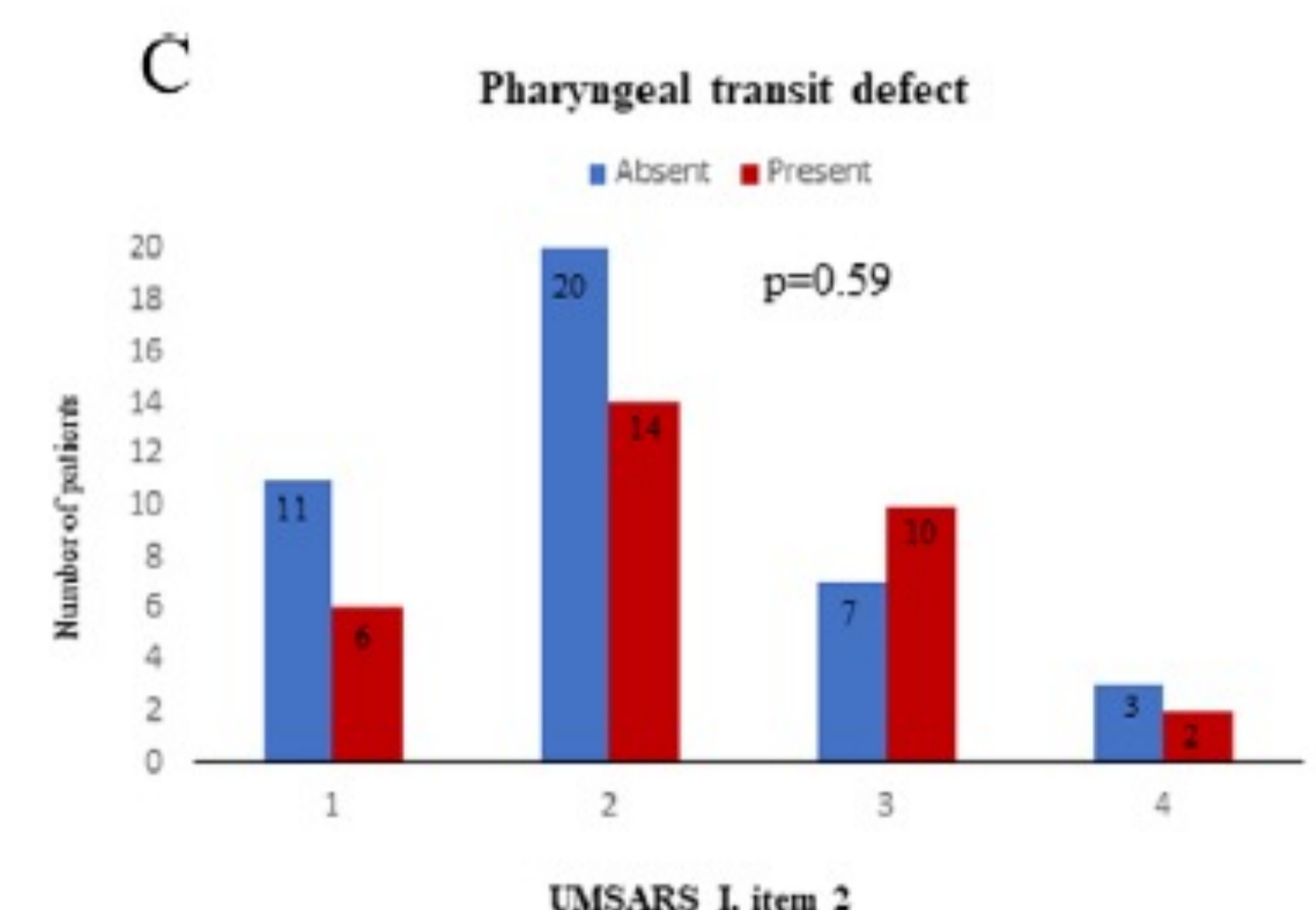
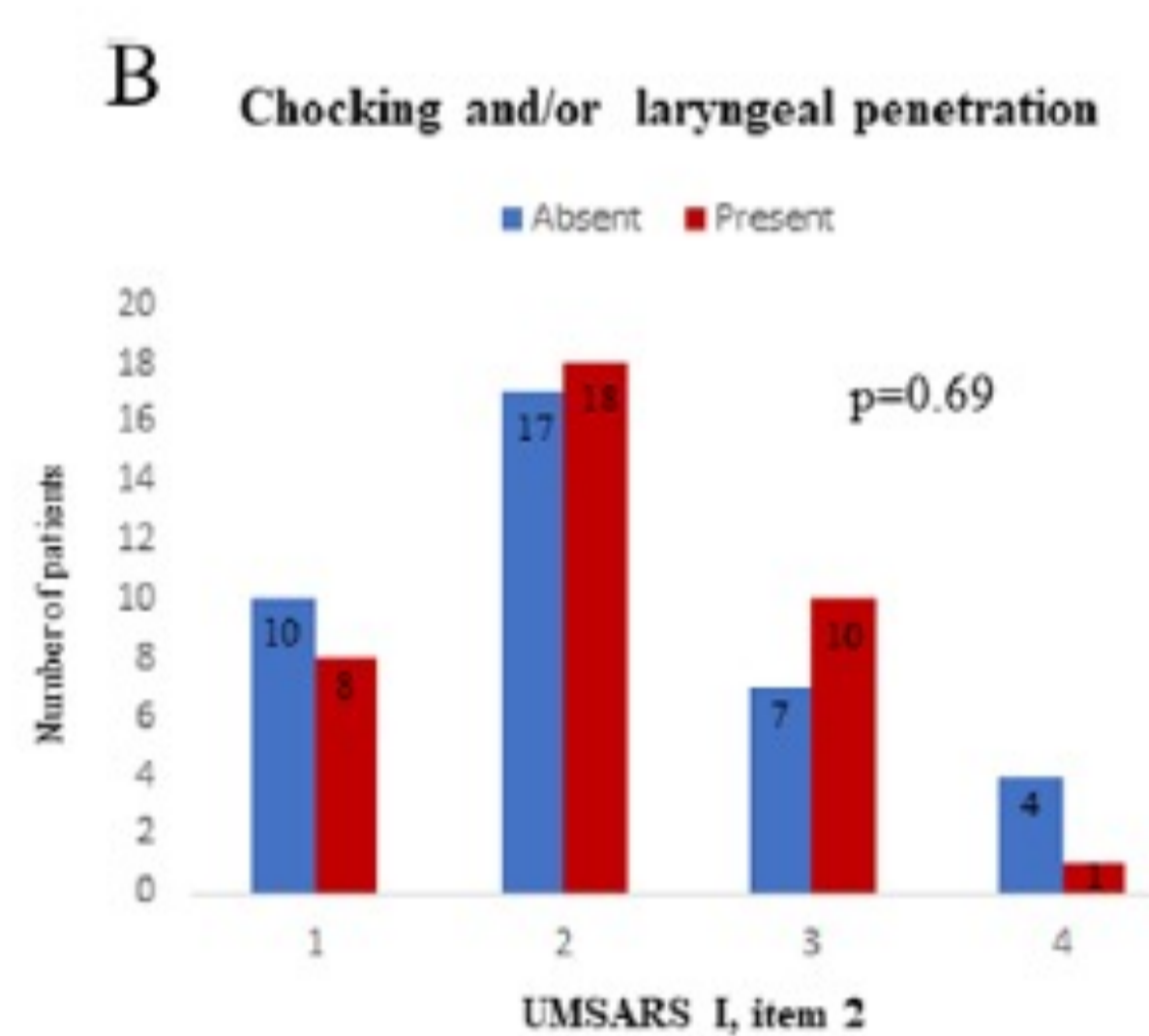
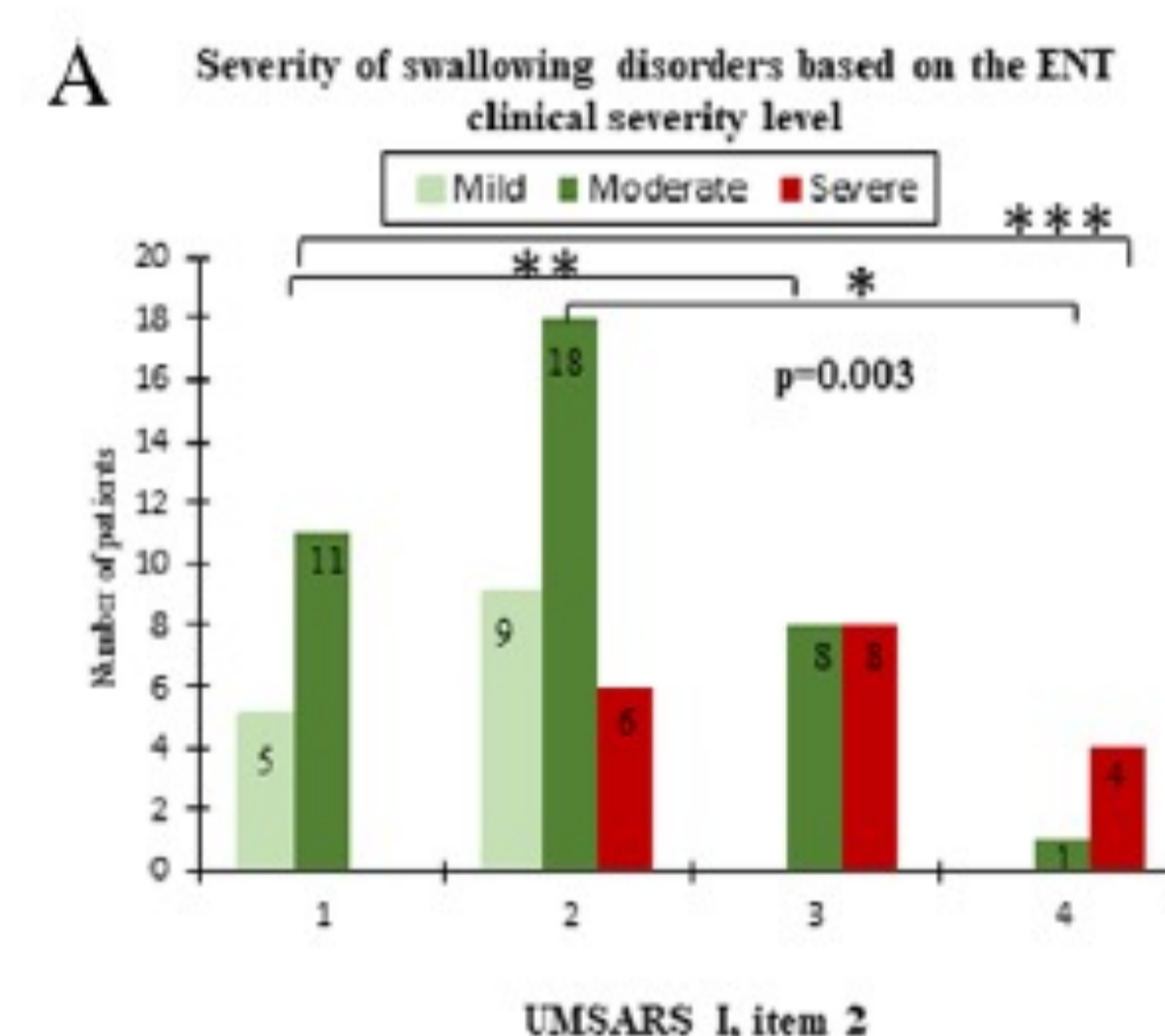
Fig. 1B The absence/presence of choking was evenly distributed over the four levels of UMSARS dysphagia severity (p 0.69)

Fig. 1C & 1D Likewise, the distribution of an abnormal pharyngeal phase or an oral transit defect was not different across UMSARS part I item 2 severity scores (p 0.59 and 0.15, respectively).

Fig. 1E Conversely, when analyzing the whole group, a significant difference in the distribution of the impairment of protective mechanisms across UMSARS part I item 2 scores was found (p 0.005), but with no statistical differences within UMSARS score groups at the pairwise comparisons.

1 UMSARS part I item 2 score	%
1 – Mild impairment. Choking less than once a week	24
2 – Moderate impairment. Occasional food aspiration with choking more than once a week	46.6
3 – Marked impairment, frequent food aspiration	22.6
4 – Nasogastric tube or gastrostomy feeding	6.6

2 Swallowing problems	%
Presence of choking	49,3
Oral transit defects	53.3
Pharyngeal transit defects	45.2
Absence of protective mechanisms	33



5/ Discussion/Conclusion

The overall clinical severity of dysphagia and the defect of protective airway mechanisms follow the UMSARS I item 2 score progression.

However, not all aspects of the standardized swallowing assessment completely match with the UMSARS based evaluation:

- presence of choking laryngeal penetrations did not follow the UMSARS item progression.
- presence of oral or pharyngeal transit defects was homogeneously distributed over item progression.

The safety concept of swallowing disorders is not covered by the UMSARS “swallowing” item.

Increasing UMSARS part I item 2 scores seems not related to a higher percentage of choking. This could be due to insidious/silent choking not disclosed during the patient interview (no cough and no throat clearing), as reported for Parkinson's disease.⁶

In conclusion, our study confirms that the UMSARS-based assessment of dysphagia well reflects the overall severity of dysphagia but does not capture key aspects of swallowing efficiency related to pharyngo-laryngeal function.

According to the 2021 consensus statement on dysphagia management in MSA, dysphagia should be investigated through both available screening questionnaires, clinical (targeted on specific aspects) and instrumental assessment at the time of MSA diagnosis and periodically thereafter.²

On a related note, our findings suggest that:

- UMSARS swallowing item should be revised to better capture pharyngo-laryngeal dysfunction in MSA patients, as part of the on-going initiative to elaborate the new MDS-UMSARS.⁷
- the early detection of these impairments by an ENT assessment may more efficiently allow the implementation of strategies to prevent malnutrition and aspiration pneumonia.⁸

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