



FACTORS RELATED TO SWALLOWING ORAL PHASE

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BACKGROUND

Efficacy of swallowing oral phase is often impaired in individuals with dysphagia. It's relationship with pharyngeal stage has been previously studied: masticatory and tongue movements have been found to influence on hyoid bone movements [1], tongue-to-palate pressure was shown to impact on pharyngeal pressure [2]. However, how much changes in oral phase efficiency may relate to swallowing safety and efficacy must be further investigated.

AIM

To examine the relationship between clinically observable oral phase measurements and parameters related to safety and efficacy of swallowing.

STUDY DESIGN

Cross-sectional correlation study

PARTICIPANTS

Thirty-nine patients were recruited:

- **Inclusion criteria** aged 18 years or over, dysphagia of different etiology for at least one consistency
- **Exclusion criteria** altered state of consciousness, edentulism not compensated by removable denture prostheses, impossibility to ingest a cracker due to severely compromised oral phase or high risk of aspiration of solids detected during FEES.

Demographic characteristics of the sample, divided for dysphagia etiology, are reported in Table 1. One patient had a tracheostomy tube placed, while two patients had PEG tube inserted.

PROCEDURE

- **FEES** was conducted with blue dyed water, pudding and cracker and score through Penetration-Aspiration scale (PAS), Yale Pharyngeal Residue Severity Rating Scale (YPRSRS) and Dysphagia Outcome and Severity Scale (DOSS)
- **Test of Mastication and Swallowing Solids (TOMASS)** was performed using GranPavesi™ cracker, videorecorded and scored by a SLT blinded to the FEES
- Anterior and posterior **tongue strength** were assessed using the Iowa Oral Performance Instrument (IOPI)
- The **time** the patients needed to consume a **meal**, the **Functional Oral Intake Scale score** and the **Body Mass Index (BMI)** were recorded.

Correlations between the TOMASS and other variables were studied using Spearman's correlation coefficient.

Table 1: Demographic characteristics of the sample

Etiology	N (%)	Age	M	F
Neurologic	19 (48.7)	64.5±16.7 (23-86)	12 (63)	7 (37)
Oncologic	3 (7.7)	64.3±6.0 (58-70)	3 (100)	0 (0)
Psychogenic	2 (5.1)	58.0±2.3 (56-60)	0 (0)	2 (100)
Presbyphagia	7 (17.9)	83.9±7.7 (76-94)	6 (86)	1 (14)
Others	8 (20.5)	61.0±16.4 (39-78)	4 (50)	4 (50)

Table 2: Correlations with TOMASS measurements

	Masticatory			
	Bites	Cycles	Swallows	Time
IOPI anterior	.33	-.36	-.05	-.34
IOPI posterior	-.26	-.47	-.16	-.45
DOSS	-.16	-.38	-.28	-.36
PAS liquids	.04	.18	-.02	.15
PAS semisolids	.04	.12	.05	.11
PAS solids	-.01	.08	.11	.10
YPRSRS valleculae	.22	.42	.46	.48
YAPRSRS pyriform	-.07	.11	.38	.27
FOIS	-.21	-.15	-.11	-.27
BMI	-.38	-.10	-.02	-.22
Meal duration	.31	.28	.49	.41

RESULTS

Compared to TOMASS' normative data [3], only 7 patients were within normal limits for number of discrete bites, masticatory cycles and swallows, while 9 patients were within normal limits for total time. Aspiration was observed in 8 patients, penetration in 12 patients. Residue greater than coating was found in 27 patients in valleculae and in 12 patients in pyriform sinus. One patient had a BMI<18.5. Meal duration was higher than 30 minutes in 11 patients. Spearman's correlation coefficient with TOMASS are shown in Table 2.; significant values are reported in red.

CONCLUSIONS & IMPLICATIONS

Swallowing oral phase correlates with tongue strength, pharyngeal residue in valleculae, overall dysphagia severity, duration of meals and BMI. Assessment and quantification of oral phase in clinical evaluation may predict parameters related to swallowing efficacy and contribute to guide clinician's decision on the need of further instrumental or nutritional assessment. Future studies with a larger sample should confirm these data.

REFERENCES

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