

## The relation between aspiration and oropharyngeal components of swallowing in Amyotrophic Lateral Sclerosis (ALS)

Bárbara Cardoso Miranda\*, Daniela Pinheiro Lima, Lúcia Figueiredo Mourão

### Abstract

The aim of this study is to examine the relation between aspiration and oral and pharyngeal components of swallowing in patients with ALS. 19 participants diagnosed with ALS followed in outpatient clinic at HC-Unicamp, the patients were underwent to a clinical swallowing evaluation (indirect and direct) and modified barium swallowing evaluation. Results: 63.2% of the participants showed aspiration. Oral escape in the interlabial region with no progression to the anterior lip, slow/weak movement during bolus transport and decreased the wave of the pharyngeal contraction were observed. And also, the results showed positive and moderate correlation between the presence of aspiration and pharyngeal wave pharyngeal function instead of oral phase.

### Key words:

ALS, Dysphagia, aspiration, videofluoroscopy

### Introduction

Swallowing impairment may occur in most individuals with ALS. Bronchoaspiration is one of the main causes of death in this disease. **Objective:** To examine the relation between aspiration and oral and pharyngeal components of swallowing in patients with ALS.

### Methods

- 19 participants diagnosed with ALS followed in outpatient clinic at HC-Unicamp.
- Clinical swallowing evaluation (indirect and direct) and modified barium swallowing evaluation (MBS).
- All participants must have signed the consent form.
- It was collected data medical records, the data of ALS diagnosis and a severity classification of disease.

**Data Analysis:** The swallowing assessment protocol (MBSImP) was used, to evaluate oral phase components (lip closure and bolus transport/lingual motion) and pharyngeal phase components (pharyngeal stripping wave and pharyngeal contraction).

Spearman Test's statistical analysis was performed. The significance level was  $p < 0.05$ .

### Results

The **table 1** shows the clinics e demographics characteristics of the group.

**Table 1:** Clinics e demographics characteristics of the group (n=19).

Variable	n	%	Mean	SD
Age (n=19)			60,5	10,7
Age at diagnosis (n=19)			5,7	3,85
Sex (n=19)				
Female	7	36,8		
Male	12	63,2		
Diagnosis (n=19)				
Amyotrophic Lateral Sclerosis (ALS)	17	90		
Progressive Lateral Sclerosis (PLS)	1	5,3		
Progressive Bulbar Paralysis (PBP)	1	5,3		

The instrumental evaluation showed alteration of the oral or pharyngeal phase of swallowing in the group (**Table 2**).

**Table 2:** Distribution of the group according to analyze components of oral and pharyngeal phases in the instrumental evaluation - Videofluoroscopic (n=19).

Swallowing Phases	Oral Escape (0-4)	n	%	
Oral Phase	0. No labial escape	3	15,8	
	1. Interlabial escape	8	42,1	
	2. Escape from interlabial space or lateral juncture	3	15,8	
	3. Escape progressing to mid-chin	4	21,1	
	4. Escape beyond mid-chin	1	5,3	
	<b>Bolus Transport/Lingual Motion (0-4)</b>		<b>n</b>	<b>%</b>
	0. Brisk tongue motion	2	10,5	
	1. Delayed initiation of tongue motion	1	5,3	
	2. Slowed tongue motion	13	68,4	
	3. Repetitive/disorganized tongue motion	1	5,3	
4. Minimal to no tongue motion	2	10,5		
Pharyngeal Phase	<b>Pharyngeal Stripping Wave (0-2)</b>		<b>n</b>	<b>%</b>
	0. Present - complete	1	5,3	
	1. Present - diminished	11	57,9	
	2. Absent	7	36,8	
	<b>Pharyngeal Contraction (0-3) - anterior view*</b>		<b>n</b>	<b>%</b>
	0. Complete	2	10,5	
	1. Incomplete	4	21,1	
2. Unilateral Bulging	5	26,3		
	3. Bilateral Bulging	5	26,3	

\*3 subjects don't take the test

The **table 3** shows positive and moderate correlation between the presence of aspiration and pharyngeal wave alteration ( $r=0.618$ ,  $p=0.005$ ).

**Table 3:** Relation between aspiration and oral and pharyngeal components of swallowing in the group (n=19).

Swallowing Phases	Aspiration		
	Components	R	p-value
Oral Phase	Oral escape	+0,063	<0,799
	Bolus Transport/Lingual Motion	+0,411	<0,080
Pharyngeal Phase	Pharyngeal Stripping Wave	+0,618	<0,005*
	Pharyngeal Contraction	+0,043	<0,875

### Conclusions

The presence of aspiration was correlated with changes in the pharyngeal function. Thus, the clinician should to consider also strategies and/or maneuvers that improve the pharyngeal function as an additional treatment to prevent bronchoaspiration in ALS patients.

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