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Original articles

Oropharyngeal dysphagia and quality of life in elderly people in the late phase after stroke

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ABSTRACT

Purpose: to verify the correlation between oropharyngeal dysphagia and quality of life in elderly people in the late phase after stroke.

Methods: a retrospective cross-sectional study, whose data were obtained by analyzing a database composed of 30 elderly people in the late phase after stroke. All participants underwent clinical and instrumental evaluation of swallowing through the fiberoptic endoscopic evaluation of swallowing. The quality of life related to swallowing was analyzed using the Quality of Life in Swallowing Disorders protocol. Data were submitted to descriptive statistical analysis and Spearman's correlation test ($p \leq 0.05$).

Results: the clinical evaluation showed that most individuals had mild oropharyngeal dysphagia, while the protocol applied in the instrumental evaluation showed swallowing with functional limitations. There was a positive correlation between burden, eating desire, eating duration, and mental health with the severity of oropharyngeal dysphagia, both by clinical and instrumental evaluation; and between the symptom's frequency and the severity of dysphagia by clinical evaluation.

Conclusion: there was a correlation between the severity of oropharyngeal dysphagia and the quality of life of elderly people in the late phase after stroke.

Keywords: Deglutition Disorders; Aged; Quality of Life; Stroke; Speech, Language and Hearing Sciences

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INTRODUCTION

Dysphagia is characterized by the difficulty in forming and transporting the food bolus from the mouth to the stomach in a safe and efficient way, which can lead individuals to dehydration, malnutrition and aspiration pneumonia, in addition to the possibility of impacting the quality of life[1].

In the adult and elderly population, dysphagia is commonly associated with stroke. Data from the Brazilian Society for Cerebrovascular Diseases (2022) report that about 70% of the people affected by a stroke do not return to their work routine and about 50% are dependent on other people to carry out their daily activities. It is also known that more than half of the patients who suffered a stroke have six to ten types of inability, including oropharyngeal dysphagia[2]. One of the most serious complications related to dysphagia is aspiration pneumonia, which, in the worst cases, can lead to death. It is noteworthy that this complication is constantly related to the high mortality rates in the population affected by a stroke[3].

In the presence of a late stroke, that is, in the non-acute phase, the clinical speech-language and hearing evaluation revealed that almost half of the patients have some degree of dysphagia, and therefore, there may be a significant relationship between the severity of the stroke and the presence of impaired swallowing[3]. The incidence increases in studies that include instrumental evaluation[4], which is the most appropriate technique to determine the risk of aspiration, both in the acute[5] and late[6] phase of stroke. The greater sensitivity of the instrumental evaluation allows the detection of both mild forms of dysphagia and alterations in the pharyngeal phase, which may be difficult to observe in the clinical evaluation[4].

Quality of life can be defined as "individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns"[7]. Knowing that dysphagia can lead to functional and consequently emotional limitations, since it is related to a social activity, eating, it is fundamental to evaluate patients also from the perspective of interferences in the quality of life resulting from stroke sequelae, in this case, the difficulties in the swallowing function[8].

In this sense, some studies used the Quality of Life in Swallowing Disorders (SWAL-QOL)[9] protocol, a specific questionnaire that addresses quality of life related to swallowing, to assess individuals with different conditions: laryngectomy[10], presence of Parkinson's disease[11], Amyotrophic Lateral Sclerosis[12] and stroke[13,14]. Regarding neurological injuries, a study involving stroke and the application of the SWAL-QOL protocol described that this population has low scores related to the quality of life which, according to the authors' analysis, are directly linked to swallowing difficulties[14]. Within this context, understanding the aspects of quality of life specifically related to the swallowing function can provide important information about the patient's perceptions of their changes and, thus, also provide better subsidies to professionals in the rehabilitation process[15].

This research aimed to verify the correlation between the degree of oropharyngeal dysphagia and quality of life in elderly people in the late phase after stroke.

METHODS

This is a retrospective cross-sectional observational study, with a convenience sample, based on the analysis of a database, with data collected from June to December 2013. The study followed all ethical precepts and was approved by the Committee for Ethics in Research of the Bauru School of Dentistry, Brazil, under protocol n. 553,710 and CAEE n. 16365913.0000.5417. The professionals invited to be judges of the instrumental evaluations signed the Free and Informed Consent Form (FICF) to participate in this study. Regarding the data used, all participants had already signed the FICF, giving permission to use their information, available in the patient's medical record.

In data collection, information from 30 elderly people in the late ph0ase after stroke, 17 males and 13 females, aged between 61 and 90 years (mean 74.4±9.6 years), were included. The following inclusion criteria were used: medical diagnosis of stroke with time ranging from 6 to 108 months, respecting the maximum time for spontaneous recovery (6 months)[16]; conducting regular neurological clinical follow-up; stable general health status to carry out the proposed exams[16] and present a minimum score of 18/19 points in the Mini-Mental State Examination to rule out the possibility of cognitive decline[17]. Individuals with a history of other associated neurological or oncological diseases were excluded from the study.

Procedures

Clinical swallowing evaluation

Three standardized food consistencies were used and offered, in the following order:

- Pudding (10 ml): 30 ml of filtered water, added with 2 g of powdered diet grape juice (Clight), thickened with a measure of spontaneous thickener (NUTILIS, Support), was used for its preparation. It was offered using a disposable spoon (10ml).
- Solid: a 1 cm thick slice of bread with approximately 4 cm in diameter was used. It is noteworthy that the bread used was baked on the same day and evaluation period, and always purchased at the same bakery.
- Liquid (10 ml): filtered water collected with a 10 ml syringe, and offered in a plastic cup (with a capacity of 50 ml), was used.

Regarding the liquid and pudding consistencies, the participants were instructed to place the contents in their mouths and voluntarily swallow. Regarding the solid consistency, the individual was asked to put the bread in their mouth and voluntarily chew, organize and swallow the bolus. The clinical evaluation was conducted and performed by a speech-language and hearing therapist, expert in oropharyngeal dysphagia. The degree of dysphagia was scored considering the results of this evaluation and classified according to the parameters of the clinical scales on severity proposed by Silva[18]. This classification was proposed specifically for individuals after stroke, defining the degree as mild, moderate and severe (Chart 1).

Chart 1. Dysphagia severity based on the clinical evaluation according to the classification proposed by Silva[18]

Classification		Observed aspects
1	Mild	When the control and transport of the bolus is delayed and slow, with no signs of laryngeal penetration on cervical auscultation. The following are observed: alteration of the labial sphincter, tongue incoordination, delay in triggering the swallowing reflex, absence of cough, no marked reduction in laryngeal elevation, no alteration of vocal behavior after swallowing and normal cervical auscultation.
2	Moderate	When the control and transport of the bolus is delayed and slow, with signs of laryngeal penetration and risk of aspiration. The following are observed: alteration of the labial sphincter, tongue incoordination, delay or absence of the swallowing reflex, absence of cough, presence of cough before, during or after swallowing, reduction in laryngeal elevation, alteration of vocal behavior after swallowing and altered cervical auscultation.
3	Severe	When there is presence of substantial aspiration and absence or failure in the complete swallowing of the bolus. The following are observed: delay or absence of the swallowing reflex, reduction in laryngeal elevation, absence of cough, presence of cough during or after swallowing, alteration of vocal behavior after swallowing, evident respiratory alteration, altered cervical auscultation and incomplete swallowing, confirmed by oximetry.

Instrumental evaluation of swallowing

The assessment of swallowing through fiberoptic endoscopic evaluation of swallowing (FEES) was performed by an otorhinolaryngologist and conducted by a speech-language and hearing therapist with experience in dysphagia, emphasizing the care to avoid the interference of the examiner. An ENF-P4 Standard Rhinolaryngoscope Fiberscope, a CHL-25 halogen light source, and an OTV-SC camera, all from Olympus, were used for the evaluation. The images were recorded on a Philips DVD. Xylocaine gel was applied over the circumference of the flexible optical fiber to not cause discomfort in the nasal cavity of the participants during its introduction.

Pudding, solid and liquid foods, which followed the same order and preparation of consistencies for the clinical evaluation, were offered, however, for FEES, 2 to 4 drops of blue aniline were added. Patients were instructed to put the liquid content in their mouth and swallow it only after verbal guidance from the speech-language and hearing therapist. For the pasty consistency, the same was done. For the solid consistency, the food was introduced into the patient's oral cavity and chewing, organization and swallowing of the food bolus, in the usual way, were requested.

At the end of the swallowing process, performed by the individuals for each consistency, guidance or suggestions for postural maneuvers, essentially for patients who had food stasis or airway permeation,

were provided. The maneuvers suggested during the examination included: head tilt or chin down, effortful swallowing, and multiple swallowing.

For analysis of the evaluations, three professionals, with at least one year of experience in the area of oropharyngeal dysphagia, were invited to be judges and score the degree of dysphagia according to the Dysphagia Outcome and Severity Scale – DOSS[19]. The score on this scale varies in levels as follows: level one - severe dysphagia - no oral route; level two - moderately severe dysphagia - needs maximum assistance or the use of only partial oral strategies; level three - moderate dysphagia - fully assisted, supervision or strategies, restriction of two or more consistencies; level four - mild to moderate dysphagia - intermittent supervision, restriction of one or two consistencies; level five - mild dysphagia - distant supervision, may have consistency restriction; level six – oral route with functional limitations/independent modifications; level seven – normal oral intake in all situations.

The agreement between the examiners was analyzed using the Kappa test and, according to its interpretation, reached 100% between examiners 1 and 2 (k=1.00; excellent), 86.7% between examiners 2 and 3 and 1 and 3 (k=0.71; substantial). The mode or consensus among the examiners was considered as the result.

Evaluation of Quality of Life

The SWAL-QOL protocol was used. It is a questionnaire containing 44 questions related to the quality of life related to swallowing, which assess eleven domains, namely: food selection, mental health, burden, eating desire, symptom frequency, fear, fatigue, communication, sleep, social function, and eating duration. The version of the protocol translated and adapted to Brazilian Portuguese[20] was used. The answers are converted into a score ranging from zero to one hundred, where zero corresponds to an unsatisfactory score and one hundred corresponds to the best answer. After conversion, the values of each answer, within each domain, are added for each patient and the result divided by the total number of questions results in the global score value.

The SWAL-QOL results were analyzed using descriptive statistics and Spearman's correlation test to verify the relationship between the oropharyngeal dysphagia classification and the score of quality of life related to swallowing[21]. The data used were organized using the Microsoft Excel Spreadsheet Software, 2010 version, and analyzed using the SigmaPlot 12.0 Software. All tests considered a significance level of 5%.

RESULTS

According to the results of the clinical evaluation of swallowing[1], it was verified that most individuals had mild oropharyngeal dysphagia, characterized by a delay in the oral and pharyngeal phases, however, without clinical signs of aspiration and/or presence of cough and wet voice, for all consistencies evaluated (Table 1).

Table 1. Distribution of the elderly people affected by stroke according to the classification proposed by Silva[18] for the different consistencies tested through the clinical swallowing evaluation

Degree of oropharyngeal dysphagia	Consistencies					
	Liquid		Pudding		Solid	
	n	%	n	%	n	%
Mild	15	52.94%	17	58.82%	19	64.71%
Moderate	12	41.18%	10	35.29%	8	29.41%
Severe	1	5.88%	1	5.88%	1	5.88%

n: absolute frequency; %: relative frequency

From the results of the instrumental evaluation of swallowing, performed through FEES, using DOSS, it was possible to verify that most individuals, approximately 64.71%, were classified as level six, that is, with swallowing functional, presenting functional limitations/independent modifications, followed by 23.56% of individuals who were classified in DOSS with level five, associated with the presence of mild dysphagia. Meanwhile, about 5.88% were classified in level four, indicating mild-moderate dysphagia, and 5.88% in level three, indicating moderate dysphagia.

Based on the data collected from the SWAL-QOL protocol, it was found that, in all domains, most patients had a maximum score close to or equal to 100 points, while the minimum score was close to 0 points for a few individuals and in a few domains. This was also observed when the minimum and maximum scores of the global score were analyzed, where the maximum was close to 100 points and the minimum was close to half the maximum score (Figure 1).

The analysis of the correlation between the degree of dysphagia in the clinical and instrumental evaluation and quality of life in each domain of the protocol showed that, for clinical evaluation, there was a moderate negative correlation between the degree of dysphagia and symptoms frequency for liquid consistency; eating desire, symptoms frequency and global score for pudding consistency; burden, eating duration, frequency of symptoms, and mental health for solid consistency. In addition, there was a statistically significant correlation for the global score on solid consistency ($p=0.005$).

As for the correlation between the degree of dysphagia based on the instrumental assessment and quality of life, there was a moderate positive correlation between the results of the DOSS classification and the domains: burden, eating desire, symptoms frequency and mental health. In addition, there was also a correlation with the global score, demonstrating that the worse the swallowing dysfunction in these cases, the greater the impact on swallowing-related to quality of life (Table 2).

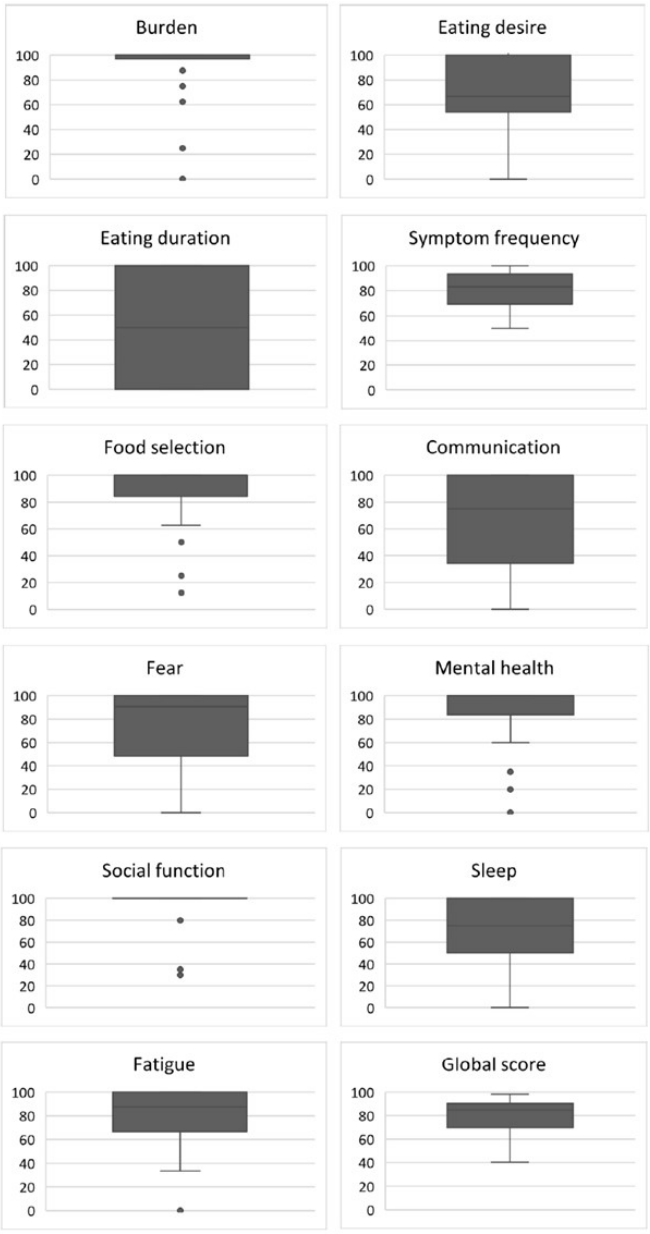

Figure 1. Box plots for scoring the Quality of Life in Swallowing Disorders protocol domains

Table 2. Correlation between swallowing, quality of life and the classification of dysphagia severity by clinical and instrumental evaluation of swallowing

Domains	Clinical Evaluation						Instrumental Evaluation DOSS Scale	
	Liquid		Pudding		Solid			
	r	p	r	p	r	p	r	p
Burden	-0.27	0.14	-0.33	0.07	-0.50	<0.01*	0.42	<0.01*
Eating desire	-0.31	0.09	-0.44	<0.01*	-0.29	0.10	0.46	<0.01*
Eating duration	-0.19	0.31	-0.30	0.10	-0.47	<0.01*	0.20	0.28
Symptom frequency	-0.47	<0.01*	-0.54	<0.01*	-0.58	<0.01*	0.54	<0.01*
Food selection	0.22	0.24	0.07	0.68	-0.12	0.50	0.08	0.66
Communication	0.15	0.40	-0.22	0.23	-0.06	0.71	0.31	0.09
Fear	-0.004	0.98	0.01	0.93	-0.10	0.56	-0.14	0.44
Mental health	-0.24	0.19	-0.31	0.08	-0.43	<0.01*	0.42	<0.01*
Social function	-0.17	0.36	-0.27	0.13	-0.25	0.17	0.21	0.25
Sleep	0.23	0.21	0.14	0.46	0.11	0.53	-0.18	0.33
Burden	-0.25	0.16	-0.11	0.55	-0.28	0.13	0.13	0.50
Global score	-0.32	0.08	-0.39	<0.01*	-0.49	0.005*	0.46	<0.01*

Spearman´s correlation test (p<0,05)
r: correlation; p: value-p

DISCUSSION

Studies analyzing the incidence of dysphagia in the elderly in the acute[22] and late[3] phases of stroke observed that more than 50% of this population has oropharyngeal dysphagia, which can vary from mild, usually in the late phase, to moderate or severe in the acute phase, according to the clinic swallowing evaluation [22]. It should be considered that, in the late phase of stroke, there may be a reduction in eating difficulties, since these individuals find different ways to adapt their diet, however, the quality of intake and the types of food can be changed[23], as is also demonstrated by the results of the present research.

It is also known that the incidence of dysphagia varies according to the evaluation method, being it more sensitive when instrumental evaluation is used[2]. In this sense, it is noteworthy that some characteristics of mild oropharyngeal dysphagia proposed in the classification used[18], which is a specific classification for the population affected by stroke, are similar in some aspects to level 6 of the DOSS scale, such as oral delay or pharyngeal and absence of signs of penetration and aspiration, which justifies the proximity of the classifications found by the clinical and instrumental evaluation.

Within this context, the results of the clinical evaluation overestimated the instrumental evaluation, which was similar to the result of another study[5], since the classification of dysphagia based on the DOSS scale was considered level 6 for more than half of the individuals (64.71%), that is, with functional limitations. In general, more than half of the analyzed sample presented swallowing dysfunction, which corresponds to what was found in previous studies[24,25].

The assessment of quality of life related to swallowing through the SWAL-QOL protocol showed that most individuals had a maximum score close to or equal to 100 points and few obtained scores close to the expected minimum, both in the scores of each domain and in the global score. A study also carried out with post-stroke individuals and using the SWAL-QOL protocol demonstrated that dysphagia had an impact on the quality of life of 100% of the sample, with a more pronounced impact in the burden, eating duration, communication and social[10] domains. Another study, in this case, conducted with individuals with Parkinson's disease[11], observed a reduction in the score of the SWAL-QOL protocol with the evolution of the disease, mainly in the burden, eating duration, communication, social, sleep and fatigue domains.

The SWAL-QOL scores, classified both by the clinical and instrumental evaluation, were correlated with the degree of dysphagia, and it was possible to observe a statistically significant correlation in both. Thus, the worse the degree of dysphagia, the greater the impact on the quality of life of these individuals. It is essential to emphasize that the dysphagic individual can develop nutritional and respiratory damage,

combined with damage to a basic social function, the ability to eat. This is a limitation that can arouse, in many cases, a feeling of frustration and discouragement, impacting quality of life in various ways[26].

The results of this research are in line with the literature, even when studies were carried out using other quality of life protocols, such as the SF 36[27] protocol, the BDI (Beck Depression inventor)[28] and the SS-QOL scale (Stroke Specific Quality of Life Scale)[28]. According to the authors of these studies, in the case of oropharyngeal dysphagia, quality of life is an important aspect to be investigated, as it can be altered, regardless of the degree of dysphagia.

It was possible to observe a correlation between some specific domains of the SWAL-QOL protocol, both by clinical and instrumental evaluation, such as the burden, eating duration, eating desire, symptoms frequency and mental health domains. All of these domains were related to at least one consistency, but more frequently to solid foods. Greater harm to food with solid texture can be explained by the need for better preparation of the food bolus, which demands a good oral phase of swallowing[13]. Alterations such as uncoordinated tongue movements, characteristic of the clinical evaluation classification of mild dysphagia and level six of the DOSS scale, can increase the effort and time required to manipulate and eject the food bolus. Therefore, it is possible to relate this type of alteration with the SWAL-QOL eating duration and burden domains, highlighted in this study with a significant correlation[29].

Meanwhile, the eating desire and mental health domains can be directly related to the burden and eating duration domains, as well as difficulties in the oral phase, encountered by the elderly studied. Detecting this fact can be an important point of reflection about the need for speech-language and hearing therapy and/or adjustments and compensations that can be made to improve the limitations that the individual presents in the swallowing function[29]. In this sense, thinking of eating as a social habit that influences the quality of life, investing in dysphagia rehabilitation can reflect positively on mental health and on the eating desire.

As for the presented sample, it is also highlighted that, regarding elderly individuals, the swallowing difficulties observed may be related not only to neurological damage but also to the aging process. Muscle and functional loss, reduced oral and pharyngeal sensitivity and reduced compensatory capacity are aspects that can lead to a prolonged oral phase during swallowing, namely reduced tongue pressure and delayed pharyngeal closure, resulting in waste and a higher risk of food penetration as age increases[2].

Some limitations must be taken into account regarding the development of the present study. Among them are the lack of information regarding the extent and location of the lesion caused by the stroke, as it is known that the presence and severity of oropharyngeal dysphagia are linked to the characteristics of the neurological involvement, and the great variability involving the time of stroke involvement in the participants that composed the sample (6 to 108 months). Researchers have been dedicated to studying brain damage patterns of dysphagia as a sequel, so this should be a crucial point in future research to be carried out. In addition, the Brazilian Portuguese version of the SWAL-QOL protocol was applied to cancer patients in the process of translation and cross-cultural adaptation[10], while this study evaluated neurological patients, which may have impacted the analysis or even the way patients responded to the protocol. Finally, the professionals' experience time, who carried out the instrumental examination analyzes, and the fact that only one professional was responsible for the clinical evaluation was also considered as a limitation.

CONCLUSION

The results obtained in this study made it possible to conclude that there were functional limitations and independent modifications, which interfered with a basic social function, i.e., eating, in elderly people in the late phase after stroke.

Thus, a correlation between the severity of oropharyngeal dysphagia and the quality of life of elderly people in the late phase after stroke, assessed by using the SWAL-QOL, was seen, demonstrating the importance of longitudinal monitoring of such individuals in relation to eating and swallowing.

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LSO: conception and design of the study, analysis and interpretation of the data, elaboration of the article or critical review for relevant intellectual content;

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JEVC, CMSO: elaboration of the article or critical review for relevant intellectual content;

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CTM: preparation of the article or critical review for relevant intellectual content, final approval of the version to be presented for publication.