Multicenter study about severity scales of neurogenic oropharyngeal dysphagia

Estudo multicêntrico sobre escalas para grau de comprometimento em disfagia orofaríngea neurogênica

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ABSTRACT

Purpose: To analyze the agreement among different severity scales for neurogenic oropharyngeal dysphagia. **Methods:** A clinical cross-sectional study was conducted. Participants were 200 individuals (108 male, 92 female) with neurogenic oropharyngeal dysphagia, aged between three months and 91 years. Four severity scales were applied to classify the oropharyngeal dysphagia: two clinical scales and two videofluoroscopic scales. Statistical analysis were conducted to verify the agreement between clinical and objective scales. **Results:** Results showed very good agreement between the clinical scales (kappa=0.92) and moderate agreement between the objective scales (kappa=0.52). **Conclusion:** Although the agreement between the clinical scales was very good and between the objective scales was moderate, further discussion and possible revision of the parameters that define the severity of oropharyngeal dysphagia in neurological patients are required.

Keywords: Deglutition; Deglutition disorders; Evaluation; Severity of illness index; Neurologic examination/methods

INTRODUCTION

Neurogenic oropharyngeal dysphagia is a common symptom in the clinical practice of the interdisciplinary health care team, with varying severity of swallowing disorders in neurological diseases[1,2].

Different neurological diseases have oropharyngeal dysphagia as a symptom, responsible for bronchopulmonary and nutritional complications, and compromising the quality of life after brain injury. Another issue that permeates the importance of the oropharyngeal dysphagia diagnosis is high hospital costs, especially when identified late and conducted without the participation of an interdisciplinary team specialized in the area[3]. To work with this symptom, the interdisciplinary team requires clinical protocols and instruments to help define the course of treatment and minimize the risks to dysphagic patients[4-8].

The severity scales of oropharyngeal dysphagia have been one of the instruments used in the diagnostic process of this symptom. They are used to aid in the identification of risk and the classification of dysfunction, to assist in the definition of the course of treatment or as a control parameter in the efficacy of rehabilitation. These scales have been proposed and do not always use agreed criteria. Moreover, most of these scales value laryngeal penetration and laryngotracheal aspiration of food as the variables that most emphasize dysphagia compromise, excluding aspects such as changed oral transit time, which can lead to compromised nutritional status[9-17].

Thus, different proposals and the lack of studies to understand the commonalities and disagreements of these scales hamper the consensus on the clinical role of evaluation procedures and treatment course as well as in the control of therapeutic efficacy.

Therefore, the aim of this study was to analyze the agreement among different severity scales in neurogenic oropharyngeal dysphagia.

Multicenter study conducted at Universidade Estadual Paulista "Júlio de Mesquita Filho" – UNESP – Marília (SP) and Botucatu (SP) and Hospital Estadual de Bauru – HEB – Bauru (SP), Brazil.

Conflict of interests: None

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METHODS

This study and its informed consent form were approved by the Research Ethics Committee of the Universidade Estadual Paulista (UNESP Marília) under number 0226/08.

A clinical cross-sectional study was conducted on 200 patients, 108 male and 92 female, aged 3 months to 91 years, with different neurological diseases. Included were individuals with neurological diagnosis of ischemic stroke, non-progressive chronic childhood encephalopathy, traumatic brain injury and degenerative neurological diseases confirmed by clinical neurological exam or neuroimaging. We excluded individuals with an unstable clinical profile or those in a comatose state.

This multicenter study had evaluations performed by six speech-language pathologists who are specialists in the field, with at least five years experience and trained in the same center for at least two years.

Clinical and instrumental swallowing evaluation

The thin liquid and paste, in a volume of 5 ml, was used in the clinical and instrumental assessment protocols of swallowing. For clinical speech therapy assessment in adults and children, we used a specific protocol[13,15]. For the instrumental examination of the 200 cases evaluated, 185 (92.5%) underwent swallowing videofluoroscopy and 15 (7.5%) swallowing videoendoscopy. Nasal endoscopy was performed using a Pentax® flexible endoscope (Pentax Corp, Tokyo, Japan) coupled to monitor and documented on a Sony® DVD recorder (Sony Corp, Tokyo, Japan). Videofluoroscopy was performed in two of the participating centers, both with a Prestilix® remote control spot film device (GE Healthcare, Piscataway, NJ, USA).

Oropharyngeal dysphagia severity scale

To evaluate the severity of dysphagia, first the clinical scales on severity proposed by Silva[14] and Furkim and Silva[16], and subsequently, the two instrumental scales proposed by Daniels et al.[9] and Ott et al.[12] were applied to the same individual and compared against each other. Consensually designated dysphagia classifications from different authors of "mild", "moderate" and "severe" were used for comparison.

The statistical method used the kappa coefficient, both to verify the correlation between clinical scales and between the instrumental scales for the severity of dysphagia[18]. A confidence interval of 95% was used for the kappa statistic. The interobserver agreement strength of the kappa value (κ) was considered as poor (<0.20), fair (0.21-0.40), moderate (0.41-0.60), good (0.61-0.80) and very good (0.81-1.00).

RESULTS

The frequency distribution according to the classification proposed by Silva[14] and Furkim and Silva[16] showed very good agreement ($\kappa = 0.92$) between the applied clinical scales on dysphagia severity. We observed that the few differences found in the studied clinical classification of dysphagia were concentrated at the "moderate" and "severe" levels (Table 1).

Table 1. Frequency distribution according to the classification proposed by Silva[14] and Furkim and Silva[16], Kappa coefficient and its respective confidence interval

Silva[14]	Furkim e Silva[16]			Total
	Mild	Moderate	Severe	
Mild	81	1	1	83
Moderate	0	65	4	69
Severe	0	4	44	48
Total	81	70	49	200

Agreement: very good
Kappa=0.92 CI: [0.88; 0.97]

To analyze the agreement between the instrumental scales, only 109 individuals were included due to the fact the other individuals had other classifications. There was moderate agreement between the classification proposed by Ott et al.[12] and Daniels et al.[9]. We observed that the differences in the videofluoroscopic scale were concentrated at the "mild" and "moderate" levels (Table 2).

Table 2. Frequency distribution according to the classification proposed by Ott et al.[12] and Daniels et al.[9]

Ott et al.[12]	Daniels et al.[9]			Total
	Mild	Moderate	Severe	
Mild	9	0	0	9
Moderate	36	26	0	62
Severe	0	1	37	38
Total	45	27	37	109

Agreement: moderate
Kappa=0.52 CI: [0.39; 0.65]

DISCUSSION

The use of scales to classify the severity of oropharyngeal dysphagia, proposed both to measure the severity of changes in swallowing and to collaborate in the definition of the course of treatment and, consequently, the recommendations made by the professional, has been proposed by different authors since the 1990s[9-15].

The main issue in using those assessment procedures is that most of those scales, clinical or instrumental, elected laryngeal penetration and laryngotracheal aspiration as the two most important markers in defining the severity of the case. This type of scales prioritizes pulmonary risk; moreover, the absence of oral transit time markers compromises the nutritional risk assessment.

The analysis of agreement between the two clinical scales was considered very good as shown in Table 1. These results are certainly related to the uniformity between the parameters of the biomechanics of swallowing, suggestive of laryngeal penetration and laryngotracheal aspiration, selected by these two scales. However, the differences, although small in pro-

portion, are present and may be related to the fact that the scale proposed by Furkim and Silva[16] included the presence of nutritional and pulmonary compromise in their scales used in the clinical profile, which is not considered in the scale proposed by Silva[14]. It is important to note that nutritional condition, rarely described as a risk parameter in oropharyngeal dysphagia scales found in the literature, is a determining factor in the severity of neurogenic oropharyngeal dysphagia, due to the need of indicating alternative feeding pathways in the presence of nutritional compromise, even in the absence of laryngotracheal aspiration.

The agreement between the instrumental scales for severity was considered moderate, as shown in Table 2. Although there is similarity in the markers, the moderate agreement strength between the instrumental scales point to conceptual differences, since the finding is objectively classified as to what each author considers mild, moderate or severe dysphagia.

This variation in interobserver agreement between the severity scales of neurogenic oropharyngeal dysphagia indicates a lack of consensus in defining what would be the concept of mild, moderate and severe before this symptom.

Furthermore, there must be reflection on the use of laryngeal penetration and laryngotracheal aspiration as the most important parameter to measure dysphagia severity. Although laryngeal penetration should be scored, it is necessary to consider its characteristics, including quantity, frequency, displacement and laryngeal tract cleaning ability, suggesting the need for criteria for different types of laryngeal penetration. Additionally, we must not forget that this sign varies according to food consistency and a condition considered serious with liquid, may be mild or moderate with pudding, having a strong impact on the course of treatment[19].

More recently, even in the presence of laryngotracheal aspiration, studies have shown that laryngeal penetration should not be considered generically because the partial or total clearing levels of the tracheobronchial tree should be considered[20].

Finally, valuing laryngeal penetration and laryngotracheal aspiration as the most important parameters in oropharyngeal dysphagia severity prevents increased oral transit time, in the absence of aspiration or laryngeal penetration, as one of the parameters that classifies the dysphagia of the individual as severe and rates the nutritional risk that the patient is subjected to. Different authors have reported the impact on compromise of the oral phase of swallowing, primarily when the oral transit time is excessively increased, negatively affecting the nutritional profile in different populations[21-24].

Consequently, even with the presence of increased oral transit time and lack of laryngeal penetration and aspiration, some of the individuals were classified by proposed scales as having mild dysphagia. In our view, any oral compromise that impacts nutritional support should also be classified as severe, thereby allowing the recommendations of the speech-language pathologist to consider both pulmonary and nutritional risk. Therefore, it is crucial at this point that the oral phase of swallowing to become valued in the classification of neurogenic oropharyngeal dysphagia.

CONCLUSION

Although the interobserver agreement between the clinical scales was very good and moderate between the instrumental scales, extensive discussion and possible revision is still required on the parameters that define the severity of oropharyngeal dysphagia in neurological patients. The lack of standardization of the parameters that define an oropharyngeal dysphagia as mild, moderate or severe may compromise the definition of the course of treatment.

RESUMO

Objetivo: Analisar a concordância entre distintas escalas para grau de comprometimento em disfagia orofaríngea neurogênica. **Métodos:** Foi realizado estudo clínico transversal. Participaram 200 indivíduos com disfagia orofaríngea neurogênica, 108 do gênero masculino e 92 do gênero feminino, com idades de 3 meses a 91 anos. Foram aplicadas quatro escalas para classificar o grau de comprometimento da disfagia orofaríngea, sendo duas escalas clínicas e duas videofluoroscópicas. Análises estatísticas foram realizadas para verificar a concordância entre as escalas clínicas e objetivas. **Resultados:** Os resultados mostraram concordância muito boa entre as escalas clínicas estudadas (Kappa=0,92) e concordância moderada entre as escalas objetivas (Kappa=0,52). **Conclusão:** Embora a concordância entre as escalas clínicas tenha sido muito boa e entre as escalas objetivas tenha sido moderada, ainda é necessária ampla discussão e possível revisão dos parâmetros que definem o grau de comprometimento da disfagia orofaríngea em pacientes neurológicos.

Descritores: Deglutição; Transtornos de deglutição; Avaliação; Índice de gravidade de doença; Exame neurológico/métodos

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