ACCURACY OF CLINICAL SWALLOWING EVALUATION FOR OROPHARYNGEAL DYSPHAGIA IN CEREBRAL PALSY

Acurácia da avaliação clínica da disfagia orofaríngea na encefalopatia crônica não progressiva

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ABSTRACT

Purpose: to evaluate the accuracy of clinical evaluation of oropharyngeal dysphagia in cerebral palsy (CP). **Methods:** the study included 45 patients with oropharyngeal dysphagia and CP, 28 males and 17 females, age ranging from 3 to 19 years old. The clinical evaluation used specific protocol and swallowing videofluoroscopy was used as gold standard. **Results:** we found that 80.0% sensitivity (95% CI [82.7, 100]), specificity of 46.67% (95% CI [18.1, 75.3]), positive predictive value of 77.78% (95% CI [62.8, 92.8]) and negative predictive value of 77.78% (95% CI [45.1, 100]). **Conclusion:** we found that the clinical evaluation of oropharyngeal dysphagia in CP has a higher sensitivity than specificity.

KEYWORDS: Deglutition Disorders; Cerebral Palsy; Evaluation; Fluoroscopy

INTRODUCTION

The presence of oropharyngeal dysphagia in cerebral palsy (CP) has been studied by several authors, who have noted the change in oral and pharyngeal phase of swallowing, including the presence of laryngeal penetration and laryngotracheal aspiration. Because of this symptomatology, children with CP may present pulmonary and nutritional complications as part of the clinical picture[1-4].

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Thus, the complete diagnostic process in CP must include a clinical evaluation and specialized instruments of oropharyngeal swallowing. Used in the investigation of oropharyngeal dysphagia, swallowing videofluoroscopy is considered the gold standard method, as there are many resources present in clinical protocols that can aid in the investigation and, consequently, direct the course of treatment.

Nonetheless, although the clinical evaluation of oropharyngeal dysphagia is an instrument widely used in the investigation of this symptom, by helping in the identification and classification of clinical findings, the accuracy of this method has been questioned. Such considerations are focused on determining what is the sensitivity and specificity of the speech-language pathology (SLP) clinical assessment to identify laryngeal penetration and laryngotracheal aspiration, primarily when such signs are silent[5-7]. Furthermore, most studies in this line of research have compared the clinical findings with the videofluoroscopic findings in the post-stroke population, while still verifying important variations in sensitivity and specificity of the clinical method of dysphagia investigation[8,9].

Therefore, this study aimed to analyze the accuracy of clinical assessment of oropharyngeal dysphagia to detect laryngotracheal penetration and aspiration in CP.

METHODS

This study was approved by the research ethics committee of the institution under number 226/2008. We affirm that ethical principles have been met in accordance with Resolution 196/96.

This was a clinical cross-sectional study with the participation of 45 individuals (28 males, 17 females, ages from 3 to 19 years) with the neurological diagnosis of cerebral palsy, regardless of motor impairment, complaining of having difficulty in swallowing or feeding. Individuals with or without alternative feeding pathways and also partial oral pathways were included.

We implemented a retrospective analysis using the database of a multicentered cross-clinical study with the participation of two public institutions of the state of São Paulo. Clinical SLP assessments and swallowing videofluoroscopy were performed using specific protocols[10-12]. Speech-language pathologists who performed the assessments were previously trained by the same training center for at least two years.

To carry out the clinical and videofluoroscopic assessments, foods of a liquid and pasty consistency were used. Pasty consistency was prepared with strawberry soy milk, adding instant food thickener of one of the brands available in the market, consisting of starch, containing in each 100g 375 kcal of calories, 100g of carbohydrates and 125mg of sodium. To prepare the consistency with the addition of the thickener, the ratio supplied by the manufacturer was used.

Oropharyngeal swallowing assessment was performed by videofluoroscopy, adding to the food consistency barium sulfate (BaSO4) in the proportion of 50% barium to 50% food without the above standard consistencies being changed. The subjects were placed in a sitting position in a special chair, adapting posture when needed. This examination was performed and recorded with a Prestilix model 1600 remote control spot film device (GE Healthcare, Piscataway, NJ, USA). The images were transmitted to a Sony model PVM-95E video monitor (Sony Corp., Tokyo, Japan) coupled to a Panasonic SVHS, model AG 7400 videocassette recorder (Panasonic Corp., Osaka, Japan)

To analyze the accuracy of clinical assessment in identifying laryngeal penetration or aspiration laryngotracheal, individuals were classified as positive or negative. The individual was considered positive in the clinical evaluation when one or more signs suggestive of laryngeal penetration or aspiration were detected and negative in the absence of these signs. Signs suggestive of laryngeal penetration or laryngotracheal aspiration were considered with the presence of coughing, choking, wet voice, dyspnea and change in cervical auscultation. Subsequently, the data were compared with findings on swallowing videofluoroscopy.

Statistical analysis was used to test sensitivity and specificity and the confidence level was 95%.

RESULTS

SLP clinical assessment had a sensitivity of 80.0% (CI95%: [82.7, 100]), specificity of 46.67% (CI95%: [18.1, 75.3]), positive predictive value of 77.78% (CI95%: [62.8, 92.8]) and negative predictive value of 77.78% (95% CI: [45.1, 100]) for the population studied.

Table 1 – Sensitivity, specificity and predictive values of clinical and videofluoroscopic findings to identify the laryngotracheal penetration and/or aspiration in CP

	Sensibilidade	Especificidade	VPP	VPN
	80%	46,67%	77,78%	77,78%
IC 95%	[82,7;100]	[18,1;75,3]	[62,8;92,8]	[45,1;100]

Legend: PPV: Positive predictive value; NPV: Negative predictive value; CI: Confidence interval Sensitivity and specificity test

DISCUSSION

The use of SLP clinical assessment as a research tool in oropharyngeal dysphagia, although safe, has variable accuracy and different reliability between raters, which may lead the clinician to enhance any sign of risk in an attempt to be more sensitive in identifying silent aspiration laryngotracheal, a fact difficult to identify in a clinical evaluation[13].

Several screening and clinical assessment protocols for oropharyngeal dysphagia can be found In the current literature; however, the vast majority of studies are in post-stroke individuals[14-18]. As a consequence, we have not found studies on accuracy of clinical assessment of dysphagia in a population similar to this study, as the studies on oropharynge dysphagia in CP, in the most part, characterizes the profile of swallowing in this population[19].

We have verified in this study that the sensitivity of the clinical method in the investigation of oropharyngeal dysphagia is higher than the specificity, i.e., the clinical evaluation was able to identify in 80% of cases the individuals with laryngeal penetration or laryngotracheal aspiration, while failing in others. Regarding the specificity, or the ability of the clinical evaluation to exclude those that do not show penetration or aspiration, it was low. The results are consistent with a majority of studies found. Low specificity is certainly related to the difficulties of the clinical method to confirm those who do not show clinical signs and also did not aspirate, was on account of the possibility of silent aspiration[20,21]. Although we did not use pulse oximetry during clinical evaluation, in view of the overall motor difficulties of the population with CP and the variations caused in the instrument, the literature shows that when oximetry has been used in the post-stroke population, the specificity increased significantly[22-24].

Another issue that must be taken into account is the variation of sensitivity and specificity values of clinical dysphagia evaluation, focusing on the fact that the clinical signs of laryngotracheal penetration and aspiration contained in the various screenings and other protocols are not consensual[25].

Whereas the sensitivity of this study reached 80%, and that other authors have found variation between 41-100% in different pathology, it seems possible to say that the clinical evaluation of oropharyngeal dysphagia in CP, performed with a specific protocol and with trained SLP therapists, was able to achieve satisfactory sensitivity[25].

The low specificity found in this study may also be related to the high frequency of silent aspiration found in the CP population due to prolonged aspiration and desensitization of the receptors responsible for the effective protection of the lower airways[2,4,26].

Another issue to be reflected on is the accuracy of CP clinical evaluation as it is related to different degrees of dysphagia correlated to the type of motor impairment found in this population. CP can be classified by overall motor impairment, with the most common being spastic (which corresponds to about 80% of cases), athetoid, ataxic and mixed. All this motor variability may interfere with the biomechanical performance of swallowing, bringing different information through the study of more homogeneous samples[27].

CONCLUSION

This is the first study examining the accuracy of the clinical assessment of oropharyngeal dysphagia in CP. It was found that the clinical SLP evaluation of oropharyngeal dysphagia in CP has greater sensitivity than specificity. Future studies are needed to identify clinical predictors of silent aspiration and increase the specificity of this instrument in this population.

RESUMO

Objetivo: analisar a acurácia da avaliação clínica da disfagia orofaríngea para detectar penetração e aspiração laringotraqueal na encefalopatia crônica não progressiva. **Métodos:** participaram deste estudo 45 indivíduos com ECNP e disfagia orofaríngea, sendo 28 do sexo masculino e 17 do sexo feminino, faixa etária variando de 3 a 19 anos. A avaliação clínica da deglutição utilizou protocolo específico e a videofluoroscopia de deglutição (VFD) foi utilizada como padrão ouro. **Resultados:** verificou-se que houve sensibilidade de 80,0% (IC 95%: [82,7;100]), especificidade de 46,67% (IC 95%: [18,1;75,3]), valor preditivo positivo de 77,78% (IC 95%: [62,8;92,8]) e valor preditivo negativo de 77,78% (IC 95%: [45,1;100]). **Conclusão:** constatou-se que a avaliação fonoaudiológica clínica da disfagia orofaríngea na ECNP apresenta maior sensibilidade que especificidade.

DESCRITORES: Transtorno de Deglutição; Paralisia Cerebral; Avaliação; Fluoroscopia

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