RESEARCH PAPER

INTERNATIONAL JOURNAL OF PURE MEDICAL RESEARCH

Health Science

KEYWORDS: Multiple Sclerosis, Dysphagia, Speech Languagem Pathology, Functional Assessment.

PROPOSAL FOR DYSPHAGIA ASSESSMENT IN PATIENTS WITH MULTIPLE SCLEROSIS AT A REFERENCE CENTER IN THE CENTER-WEST OF BRAZIL

Volume-3, Issue-5, May - 2018

Inez J L Amaral* — Speech Languagem Pathologist, PhD student by the Post-Graduation Program in Health Sciences of the Federal University of Goiás (UFG), Goiânia-Goiás, Brazil.* Corresponding Author inezjanaina@gmail.com

Denise S Diniz — Neurologist, PhD in Health Sciences – UFG; Professor of the Post-Graduate Program in Health Sciences -UFG; Director of the Reference Center for Research and Treatment in Multiple Sclerosis (CRIEM), Federal University of Goiás, Goiânia-Goiás, Brazil.

Valeriana C Guimarães — Speech Languagem Pathologist, PhD in Health Sciences - UFG, Professor of the Post-Graduation Program in Health Sciences of the Federal University of Goiás, Goiânia-Goiás, Brazil.

Marcos Alexandre Diniz Carneiro — Neurologist of the Reference Center for Research and Treatment in Multiple Sclerosis (CRIEM), Master's Degree in the Health Sciences in Postgraduate Program of the Federal University of Goiás, Goiânia-Goiás, Brazil.

Article History
Received: 20.02.2018
Accepted: 13.04.2018
Published: 10.05.2018

ABSTRACT.

Dysphagia is generally underestimated by patients with Multiple Sclerosis and has a known prevalence in 30 to 40% of cases. The management of swallowing reduces the risks of dehydration, malnutrition, pulmonary alterations and death. The aim of this study was to perform the evaluation of swallowing in patients with Multiple Sclerosis at a Reference and Research Center in Multiple Sclerosis of a university hospital in the center-west of Brazil. A cross-sectional study was carried out between July 2015 and March 2016, with 73 adult and elderly patients. It was analised the oral motor system and vocal evaluation. The functional evaluation of swallowing were performed using liquid-pasty, liquid, pasty and solid food consistencies. Dysphagia was found in 30.14% of the patients, with significant alterations in the qualification and propulsion of the food bolus and impairment of the oral and pharyngeal phases of swallowing.

INTRODUCTION

In Multiple Sclerosis (MS), the demyelination of the structures of the cortico-bulbar tract, cerebellum, brain stem and cranial nerve can seriously compromise the physiology of deglutition. However, signs and symptoms of dysphagia are frequently neglected by patients and caregivers.[1-7]

Therefore, recognize the patients with swallowing abnormalities in early stages of MS is essential in the prevention of pneumonias, laryngeal aspiration, malnutrition, dehydration, and its complications that can results in death. As well as the apropriate elaboration of the therapeutic treatment for the differents stages and difficulties in swallowing. [3-9]

The present study aimed to perform the clinical evaluation of swallowing in patients with MS at the Reference Center for Research and Treatment in Multiple Sclerosis (CRIEM) on the University Hospital (HC) of the Federal University of Goiás (UFG) in central-western Brazil.

MATERIAL AND METHODS

Cross-sectional study conducted at the Reference Center for Research and Treatment in Multiple Sclerosis (CRIEM) of the university hospital (HC) of the Federal University of Goiás (UFG), central-western Brazil in the period from July 2015 to March 2016. Data collection started after approval by the Ethics Committee of the university hospital (CAAE 44421315.0.0000.5078).

During the study period, analysing the CRIEM database, after applying the inclusion and exclusion criterias, 94 patients were considered eligible and the sample size was defined in 73 patients (considering 95% confidence interval).

Patient clinical data, such as type of MS and Expanded Disability Status Scale (EDSS) scores were collected in the medical records, the demographic data were collected with an instrument specifically developed for this study, including gender, age, race, diagnostic time and comorbidities.

The funcional evaluation of swallowing (Avaliação Funcional da Deglutição - AFD) was elaborated for this study, with the contribution of four judges speech-language therapists specialists in dysphagia. The aim of the instrument was to evaluate swallowing using various volumes and consistencies.

The protocol included the identification of the participant, analysis of the Oral Motor System (OMS), vocal evaluation [10-11] presence of oral or digestive disorders and the functional evaluation of swallowing itself. The patient was placed in a seated position, facing the researcher, aiming the better visualization of the oral and laryngeal movements, and suggestive sings of fatigue.[12-13] The OMS was evaluated by the observation of the Orofacial Complex (OFC) both at rest position and voluntary activity. [14-16] Patients were questioned about digestive disorders (such as gastroesophageal reflux, gastritis, and others).

For the AFD, it was offered food in liquid pasty consistency (water with thickener for nectar consistency, in a total of 30ml), liquid (water, in a total of 90 ml), pasty consistency (water with thickener for pudding consistency, in a total of 30ml) and solid (cream cracker). For all consistencies were observed: capture of food in both spoon and glass, chewing and lip sealing, oral transit time, presence of nasal reflux, number os swallows for each supply, laringeal elevation and anteriorization, vocal quality, presence of suggestive signs of penetration and/or laryngeal aspiration (coughing or gagging),

breath-swallowing coordination, presence of food residues in oral cavity and signs of fatigue. [12,17-20]

Swallowing was classified according to the American Speech-Language Hearing Association – National Outcome Measurement System (ASHA NOMS) [21], divided into seven levels. In this scale, the clasisfication ranges this scale ranges from patients who can not receive oral food, those who need adaptations (consistency, maneuvers) to those who receive oral diet without restrictions. [21-22]

Data analysis was performed with an Intel Core I7 3537-U (2.50GHz), Minitab 17.3 software. Statistics were created in the presentation of the frequency distribution between variables of patient's identification data using Spearman's Correlation. For the analysis of the existence of dependence between type of MS and the presence of dysphagia, the Fischer's exact test was used. As for the variables time of diagnosis and EDSS scores, taking the abnormal distribution and ordinal character of those, the analysis of the relation with the presence of dysphagia was performed using the Kruskal-Wallis test. For all the tests, a conficence level of 95% was set, being considered $p<0.05$.

RESULTS

The study consisted of 73 patients, 62 (84.93%) females, ranging in age from 21 to 75 years. The non-white races presented higher prevalence, in 38 individuals (52.05%). There was no significant difference between sex, age and race, as evidenced in table 01.

Table 01 – Demografic data distribution related to type of Multiple Sclerosis. CRIEM, Goiânia, Goiás – Brazil 2016 (N=73)

Variables	Frequency n (%)	Type of Multiple Sclerosis			*p-value
		SP n (%)	RR n (%)	PP n (%)	
Sex					0.035
Female	62 (84.93)	4 (5.48)	58 (79.450	--	
Male	11 (15.07)	2 (2.74)	8 (10.96)	1 (1.37)	
Total	73 (100)	6 (8.22)	66 (90.41)	1 (1.37)	
Age (years)					0.263
21 – 30	8 (19.96)	1 (1.37)	7 (9.59)	-	
31 – 40	11 (15.07)	-	11 (15.07)	-	
41 – 50	18 (24.66)	2 (2.74)	16 (21.92)	-	
51 – 60	23 (31.51)	3 (4.11)	19 (26.03)	1 (1.37)	
61 or more	13 (17.81)	-	13 (17.81)	-	
Total	73 (100)	6 (8.22)	66 (90.41)	1 (1.37)	
Race					0.463
White	35 (47.95)	2 (2.74)	33 (45.20)	-	
Non white	38 (52.05)	4 (5.48)	33 (45.20)	1 (1.37)	
Total	73 (100)	6 (8.22)	66 (90.40)	1 (1.37)	
Total	73 (100)	5 (6.85)	66 (90.41)	1 (1.37)	

*Spearman correlation. SP: Secundary Progressive; RR: Relapsing Remitting; PP: Primary Progressive

Regarding the EDSS, 50 (68.49%) individuals presented scores between 0 and 3.5. The Relapsing Remitting MS (RRMS) were the most presente in 66 (90.41%) of the participants. Time diagnosis ranged from five to ten years in 28 individuals (38.36%) and more than ten years in 25 individuals (34.25%). The results presented a significant differece related to dysphagia and diagnostic time, dysphagia and type of MS and dysphagia and EDSS, according to table 2.

Tabela 2 – Relationship between the presence of dysphagia and the variables time of diagnosis, Multiple Sclerosis type and Expanded Disability Status Scale (EDSS) scores. CRIEM, Goiânia, Goiás - Brazil 2016. (N=73)

Variables	Frequency n(%)	Dysphagia		p-value
		Absent n(%)	Present n(%)	
Time of diagnosis (years)				0.688*
0 – 5	20 (27.40)	15 (20.55)	5 (6.85)	
5 -10	28 (38.36)	21 (28.77)	7 (9.59)	
11 – 15	18 (24.66)	11 (15.07)	7 (9.59)	
16 – 20	5 (6.85)	4 (5.48)	1 (1.37)	
21 or more	2 (2.74)	-	2 (2.74)	
TOTAL	73 (100)	51 (69.86)	22 (30.14)	
Multiple Sclerosis type				0.574**
RR	66 (90.41)	44 (60.27)	22 (30.14)	
SP	6 (8.22)	6 (8.22)	-	
PP	1 (1.37)	1 (1.37)	-	
TOTAL	73 (100)	51 (69.86)	22 (30.14)	
EDSS (scores)				0.312*
1 – 3.5	50 (68.49)	34 (46.57)	16 (21.96)	
4 – 6.5	21 (28.77)	15 (20.55)	6 (8.22)	
7	2 (2.74)	2 (2.74)	-	
TOTAL	73 (100)	51 (69.86)	22 (30.14)	

*Kruskal-Wallis; **Fisher's exact test; RR: Relapsing Remetting; SP: Secundary Progressive PP: Primary Progressive

In this study, 22 (30.14%) patients had dysphagia. EDSS scores from 0 to 3.5 showed more swallowing disorders, according to the ASHA NOMS dysphagia rating. Of these individulas, ten (13.96%) were classified in level 5, five (6.85%) in level 4 and one (1.37%) level 3. Individuals with EDSS scores above 6 did not had dysphagia. There were no significant diferences between EDSS scores and ASHA NOMS rating, as observed in table 3.

Table 3 – Correlation between Expanded Disability Status Scale scores(EDSS) e American Speech-language Hearing Association National Outcome Measurement System rating (ASHA NOMS). CRIEM, Goiânia, Goiás - Brazil 2016. (N=73)

Variables	Freq n (%)	ASHA NOMS rating					*p-value
		3 n (%)	4 n (%)	5 n (%)	6 n (%)	7 n (%)	
EDSS							0,458
0 – 3,5	50 (68.49)	1 (1.37)	5 (6.85)	10 (13.69)	18 (24.66)	16 (21.92)	
4 – 5,5	21 (28.77)	-	1 (1.37)	5 (6.85)	7 (9.59)	8 (10.96)	
6 – 7,5	2 (2.74)	-	-	-	-	2 (2.74)	
Total	73 (100)	1 (1,37)	6 (8.22)	15 (20.54)	25 (34.25)	26 (35.62)	

*Spearman correlation

According to the AFD, the most frequent alterations were related to oral transit time, present in 17 (23.29%) cases for liquid-party consistency and 11 (15.07%) for liquid and pasty food consistencies. Laryngeal elevation and anterioration were considered altered in six (8.22%) individuals considering liquid-pasty consistency, in four (5.48%) for liquid consistency and in three (4.11%) individuals for

pasty consistency (Table 4).

Table 04 – Distribution of patiens according to food consistencies and changes in the Functional Deglutition Evaluation (AFD). CRIEM, Goiânia, Goiás - Brasil 2016. (N:73)

Variables	Food consistency n (%)		
	Liquid pasty	Liquid	Pasty
Oral Transit Time			
Appropriate	56 (76.71)	62 (84.93)	69 (80.82)
Altered	17 (23.29)	11 (15.07)	11 (15.07)
No information	-	-	3 (4.11)
Total	73 (100)	73 (100)	73 (100)
Laryngeal elevation and anterioration			
Appropriate	67 (91.78)	69 (94.52)	67 (91.78)
Altered	6 (8.22)	4 (5.48)	3 (4.11)
No information	-	-	3 (4.11)
Total	73 (100)	73 (100)	73 (100)

Considering solid consistency, chewing alterations were observed in 19 (26.02%) of cases, alterations in oral transit time in 18 (24.66%) individuals, and presence of food residues in the oral cavity in four cases (5.48%). However, four (5.48%) patients did not accept the food supply in this consistency and two (2.74%) partially acceped the offer. (table 5).

Table 05 – Distribution of patients according to solid consistency evaluation. CRIEM, Goiânia, Goiás - Brasil 2016. (N:73)

Variables	Sample distribution		
	Frequency (%)		Adjusted percentage (%)
SOLID FOOD			
Chewing			
Appropriate	50	68.49	72.46
Altered	19	26.02	27.54
No information	4	5.48	-
Total	73	100	100
Oral transit time			
Appropriate	51	69.86	73,91
Altered	18	24.66	26,09
No information	4	5.48	-
Total	73	100	100
Residue in oral cavity			
Absent	65	89.04	94.20
Present	4	5.48	5.80
No information	4	5.48	-
Total	73	100	100

DISCUSSION

Deglutition disorders are life-threatining factors and often underestimated or neglected by patients with MS. [2,3,7,23] This population presents a high risk of dehydration, malnutrition and pulmonar alterations, which can lead to death. [2,3]

In this study, unlike the literature, the prevalence of the disease was in patients between 41 and 60 years old. [24-26] Probably this data is related to the fact that most of the participants were already in treatment in the CRIEM, and presented diagnosis and time of disease greater than five years. In this cases, when motor alterations begins, the pursuit for treatment is more consistent.

The predominant race was non white, followed by caucasians, however, it had no statistical significance between them. Considering that Brazil covers areas of equatorial, tropical and temperate climate, the population presents a unique ethnic identity, therefore the results are diferent from other studies, which determine the caucasian race the most affected by the disease. [25-27] Even so, the prevalence of the disease depends on the region of Brazil and its predominant climate, and the influence of immingration (between regions and other countries) on racial miscegenation. [27]

Considering the type of MS, individuals that had dysphagia were Relapsing Remitting (RR) MS type. According to Fernandes et al. (2013) [4], the progressive forms of the disease – Primary progressive (PP) and secondary progressive (SP) – are most often susceptible to have severe swallowing changes. Considering that the majority of the sample were RRMS, it was not possible to correlate those findings.

Patients with mild disabilities are most likely to have complaints about swallowing changes, considering the scores of EDSS according to Bergamaschi et al. (2008) [2], De Pauw et al. (2002) [8] e Beckmann et al. (2015) [23]. In this study, the presence of dysphagia was more common in the individuals withs EDSS scores between 0 and 3.5, with mild to moderate changes in the swallowing process through functional evaluation.

In MS there is no standard characteristic for dysphagia, since the signs and symptoms of dysphagia will depend of the affected functional systems. [28] Nevertheless, in this study it was not possible to determine the functional systems affected, but it was noticed that the deglutition disorders happened for all consistencies evaluated, with impairment in both oral and pharyngeal phases of swallowing, suggesting that it is due to both motor and sensory intraoral alterations. [25]

In the research for the study, there were not outpatient assessments protocols designed to clinicaly evaluate the swallowing process. This way, an evaluation instrument was elaborated including the avaluation of both orofacial complex involved in swallowing and varied food consistencies. Although it was not the purpose, the results found with this instrument demonstrated its effectiveness. In the evaluated population, the prevalence of dysphagia was 30.14%, a result similar to that described in the literature. [1-7,9]

REFERENCES

[1] Calcagno P, Ruoppolo G, Grasso MG, De Vincentiis M and Paolucci S. (2002) Dysphagia in multiple sclerosis – prevalence and prognostic factors. Acta Neurol Scand, 105, 40-43.

[2] Bergamaschi R, Crivelli P, Rezzani FP, et al. (2008) The DYMUS questionnaire for assessment of dysphagia in multiple sclerosis. J Neurol Sci, 269, 49-53.

[3] Poorjavad M, Derakhshandeh F, Etemadifar M, et al. (2010) Oropharyngeal dysphagia in multiple sclerosis. Mult Scler, 16(3), 362-365.

[4] Fernandes AMF, Duprat AC, Eckley CA, et al. (2013) Oropharyngeal dysphagia in patients with multiple sclerosis: do the disease classificationn scales reflect dysphagia severity? Braz J Otorhinolaryngol, 79(4), 460-5.

[5] Oliveira EML, Souza NA. Esclerose Múltipla. (1998) Rev Neurosciências, 6(3), 114-118.

[6] Solaro C, Rezzani C, Trabucco E, et al. (2013) Prevalence of patient-reported dysphagia in multiple sclerosis patients: an italian multicenter study (using the DYMUS questionnaire). J Neurol Sci, 331, 94-97.

[7] Guan XL, Wang H, Huang HS, Meng L. (2015) Prevalence of dysphagia in multiple sclerosis: a systematic review and meta-analysis. Neurol Sci, 36, 671-681.

[8] De Pauw A, Dejaeger E, D'hooghe B, Carton H. (2002) Dysphagia in multiple sclerosis. Clin Neurol Neurosurg, 104, 345-351.

[9] Ziemssen R. (2011) Symptom management in patients with multiple sclerosis. J Neurol Sci, 311(51), 548-552.

[10] Ortiz KZ. (2010) Disartrias. In: ORTIZ, KZ.(org) Distúrbios Neurológicos Adquiridos. 2nd edn. Manole, Barueri-SP, 54-72.

[11] Pinho SMR, Pontes P. (2008) Avaliação perspectiva da fonte glótica – Escala RASATI. In: Músculos intrínsecos da laringe e dinâmica vocal. Revinter, Rio de Janeiro.

[12] Padovani AR, Moraes DP, Mangili LD, Andrade CRF. (2007) Protocolo Fonoaudiológico de Avaliação do Risco para Disfagia (PARD). Rev Soc Fonoaudiol, 12(3), 199-205.

[13] Bolzan GP, Christmann MK, Berwig LC, Costa CC, Rocha RM. (2013) Contribuição da ausculta cervical para a avaliação clínica das disfagias orofaríngea. Rev CEFAC, 15(2), 455-465.

[14] Frazão Y, Manzi SB. (2012) Eficácia da intervenção fonoaudiológica para atenuar o envelhecimento facial. Rev CEFAC, 14(4), 755-762.

[15] Mallampati SR, Gat SP, Gugino LD, et al. (1985) A Clinical sign to predict difficult tracheal intubation: a prospective study. Can Anaesth Soc J, 32(4), 429-34.

[16] Jorge TM, Bassi AKZ, Yarid SD, Silva HM, Silva RPR, Caldana ML, Bastos JRM. (2009)

Relação entre perdas dentárias e queixas de mastigação, deglutição e fala em indivíduos adultos. Rev CEFAC, 11(3), 391-397.
[17] Silva ACV, Dantas RO, Fabio SRC. (2010) Avaliação fonoaudiológica e cintilográfica da deglutição de pacientes pós acidente vascular encefálico. Pró-fono R Atual Cient, 22(3), 317-24.
[18] Whitaker ME, Trindade Júnior AS, Genaro KF. (2009) Proposta de protocolo de avaliação clínica da função mastigatória. Rev CEFAC, São Paulo.
[19] Soares TJ, Moraes DP, Medeiros GC, Sassi FC, Zilberstein B and Andrade CRF. (2015) Tempo de trânsito oral: revisão crítica da literatura. Arq Bras Cir Dig, 28(2), 144-147.
[20] Dantas MORL, Auler Jr JOC and Andrade CRF. (2010) Avaliação da deglutição de idosos com indicação de revascularização miocárdica. Pró-fono R Atual Cient, 22(4), 385-390.
[21] American Speech-Language Hearing Association National Outcome Mesurement System (ASHA NOMS): Adult Speech-Language Pathology training manual. Rockville, MD: American Speech-Language Hearing Association, 1998.
[22] Medeiros GC. (2010) Disfagia orofaríngea em pacientes submetidos à intubação orotraqueal prolongada em UTIs. [Dissertation]. USP, São Paulo.
[23] Beckmann Y, Gürgör N, Çakir A, Arici S, Incesu Tk, Seçil Y and Ertekin C. (2015) Electrophysiological Evaluation of Dysphagia in the Mild or Moderate Patients with Multiple Sclerosis: A Concept of Subclinical Dysphagia. Dysphagia, 30, 296-303.
[24] Ramagopalam SV, Sadovnick AD. (2011) Epidemiology of Multiple Sclerosis. Neurol Clin, 29, 207-217.
[25] Tassorelli C, Bergamaschi, R, Buscone, S, et al. (2008) Dysphagia in multiple sclerosis: from pathogenesis to diagnosis. Neurol Sci, 29, S360-S363.
[26] Kamm CP, Uitdehaag BM and Polman CH. (2014) Multiple Sclerosis: current knowledge and future outlook. Eur Neurol, 72, 132-141.
[27] Pereira ABCNG, Lacativa MCS, Pereira FFCC, Alvarenga MP. (2015) Prevalence of Multiple Sclerosis in Brazil: a systematic review. Multiple Sclerosis and related disorders, 4, 572-579.
[28] Prosiegel M, Schelling A and Wagner-Sonntag E. (2004) Dysphagia and Multiple Sclerosis. The International MS Journal, 11, 22-31.