Screening tools for oropharyngeal dysphagia in stroke

Instrumentos de rastreio para disfagia orofaríngea no acidente vascular encefálico

Tatiana Magalhães de Almeida[1], Paula Cristina Cola[1], Leandro de Araújo Pernambuco[2], Hipólito Virgílio Magalhães Junior[3], Roberta Gonçalves da Silva[1]

ABSTRACT

Purpose: To identify the parameters present in the screening tools for oropharyngeal dysphagia in stroke published in the literature. **Research strategy:** For the selection of studies, the swallowing disorder descriptors *stroke*, *screening*, *evaluation* and *dysphagia* were used. MEDLINE, Embase, LILACS, SciELO and the Cochrane Library databases were consulted. **Selection criteria:** We selected articles in the English, Portuguese and Spanish languages published up to December 2014 whose methodological approach referred to screening tools for oropharyngeal dysphagia designed for adults with stroke. The parameters used in the various screening tools were grouped by equality and/or likeness. We performed a descriptive analysis and calculated the frequency of found parameters. **Results:** We found 688 articles and after consideration of the inclusion and exclusion criteria, 23 articles were effectively analyzed. Of the 20 tools found, 90% used some type of food offer orally in screening for dysphagia, mostly water. We found 19 different parameters not related to food offer and 12 parameters related to food offer. **Conclusion:** There is no consensus among the studies on the most sensitive and specific parameters to compose the screening method for oropharyngeal dysphagia in stroke.

Keywords: Deglutition disorders; Mass screening; Stroke; Deglutition; Diagnosis

RESUMO

Objetivo: Identificar os parâmetros presentes nos instrumentos de rastreio para a disfagia orofaríngea no acidente vascular encefálico, publicados na literatura. **Estratégia de pesquisa:** Para a seleção dos estudos, foram utilizados os descritores: transtornos de deglutição, acidente vascular cerebral, rastreio, *screening*, avaliação e disfagia. Foram consultadas as bases de dados MEDLINE, Embase, LILACS, SciELO e biblioteca Cochrane. **Critérios de seleção:** Foram selecionados artigos em inglês, português e espanhol, publicados até dezembro de 2014, cuja abordagem metodológica referisse instrumentos de rastreio para a disfagia orofaríngea, elaborados para indivíduos adultos com acidente vascular encefálico. Os parâmetros utilizados nos diferentes instrumentos de rastreio foram agrupados por igualdade e/ou semelhança. Foi realizada análise descritiva e calculada a frequência dos parâmetros encontrados. **Resultados:** Foram encontrados 688 artigos e, após consideração dos critérios de inclusão e exclusão, 23 artigos foram efetivamente analisados. Dos 20 instrumentos encontrados, 90% utilizaram algum tipo de oferta via oral no rastreio para a disfagia, sendo a maioria, a água. Foram encontrados 19 parâmetros distintos, não relacionados à oferta de alimento e 12 parâmetros relacionados à oferta de alimento. **Conclusão:** Não há consenso, entre os estudos, sobre os parâmetros mais sensíveis e específicos para compor o método de rastreio para disfagia orofaríngea na população com acidente vascular encefálico.

Descritores: Transtornos de deglutição; Programas de rastreamento; Acidente vascular cerebral; Deglutição; Diagnóstico

INTRODUTCION

Oropharyngeal dysphagia is common in patients with stroke. It is known to be associated with general health intercurrences of the individual, which may cause pneumonia, dehydration, malnutrition and extend length of hospitalization, in addition to increasing the costs of health care[1]. Thus, early identification of oropharyngeal dysphagia is extremely important to minimize the adverse consequences to the health of the patient with stroke[2,3].

Therefore, emerging in recent years has been a mobilization aiming at oropharyngeal dysphagia screening. According to the American Speech-Language-Hearing Association (ASHA), screening for dysphagia is a swallowing investigative procedure that classifies whether the individual passes or fails, and therefore, verifies the need for comprehensive assessment of swallowing function or referral to other professionals and/or medical services[4]. Thus, screening differs from the clinical evaluation of swallowing, as this is to evaluate the biomechanics of swallowing and define the specific diagnosis of oropharyngeal dysphagia and course of treatment in regards to feeding pathway. Despite the growing body of research in the area, there is still no consensus in the literature regarding what parameters should be used in the best screening tool for oropharyngeal dysphagia in stroke, as differences are found between the published tools[2]. Some of these tools use indirect methods, without the offer of food, having variability in these parameters. Others employ, as well as indirect parameters, the use of food that also varies according to consistency. Therefore, due to the lack of consensus on what should be the screening tool for oropharyngeal dysphagia in stroke, the investigation into the variability of the parameters included in these tools has become relevant.

PURPOSE

The purpose of this literature review study was to identify the parameters present in screening tools for oropharyngeal dysphagia in individuals with stroke.

RESEARCH STRATEGY

The review of the literature was performed with delimitation of the following steps: problem identification with formulating the research question; establishment of keywords; determining the criteria for inclusion and exclusion of articles; selection of articles and definition of the information to be extracted. The question which supported the revision was: *Which parameters should compose a screening tool for oropharyngeal dysphagia in individuals with stroke?*

We performed a study of the international literature published in the English, Portuguese and Spanish languages using the databases of MEDLINE, Embase, LILACS, SciELO and the Cochrane Library. Keywords based on Health Sciences Descriptors (DeCS) and free terms used for the search: swallowing disorders, stroke, screening, evaluation and dysphagia, in various combinations, targeting the greatest number of studies. The references found in the chosen articles were also verified in order to identify other studies that might have been omitted in the electronic search.

SELECTION CRITERIA

We included articles whose methodological approach addressed screening tools for oropharyngeal dysphagia, designed for adult patients with stroke. Articles published up to December 2014 with texts available in their entity were analyzed. Publications were excluded if they were not compatible with the discussed topic, studies of literature review, those which were repeated in databases and those not directly citing the parameters of the screening tool (Figure 1).

DATA ANALYSIS

The complete and relevant texts for the revision were analyzed and the following data were subsequently extracted: authors, year of publication, number of subjects, professionals who administered the tools, tests used, psychometric measures and also all parameters used in different dysphagia screening tools in stroke, which were grouped for equality and/or likeness. We performed a descriptive analysis and calculated the frequency of found parameters.

RESULTS

After the initial search of databases, 688 articles were found. After consideration of the inclusion and exclusion criteria, 23 articles were analyzed, and in these articles, 20 different tools were found[5-26] (Chart 1).

Of the tools found, 18 (90%) used some type of food offer orally in screening for dysphagia, with most (n=17, 72.2%) being water. The parameters found in the selected articles were grouped by similarity and/or equity, thus totaling 19 different parameters not related to the offer of food and 12 parameters related to the offer of food (Chart 2).

DISCUSSION

Screening seeks to identify subjects likely to present a specific problem[27]. Therefore, screening tools for oropharyngeal dysphagia should identify individuals with suspected oropharyngeal dysphagia. In the presence of positive screening, it is necessary to confirm the diagnosis by means of a more comprehensive swallowing assessment performed by a trained professional. Thus, the term *screening* does not seem to be well defined in the current literature, since the tools
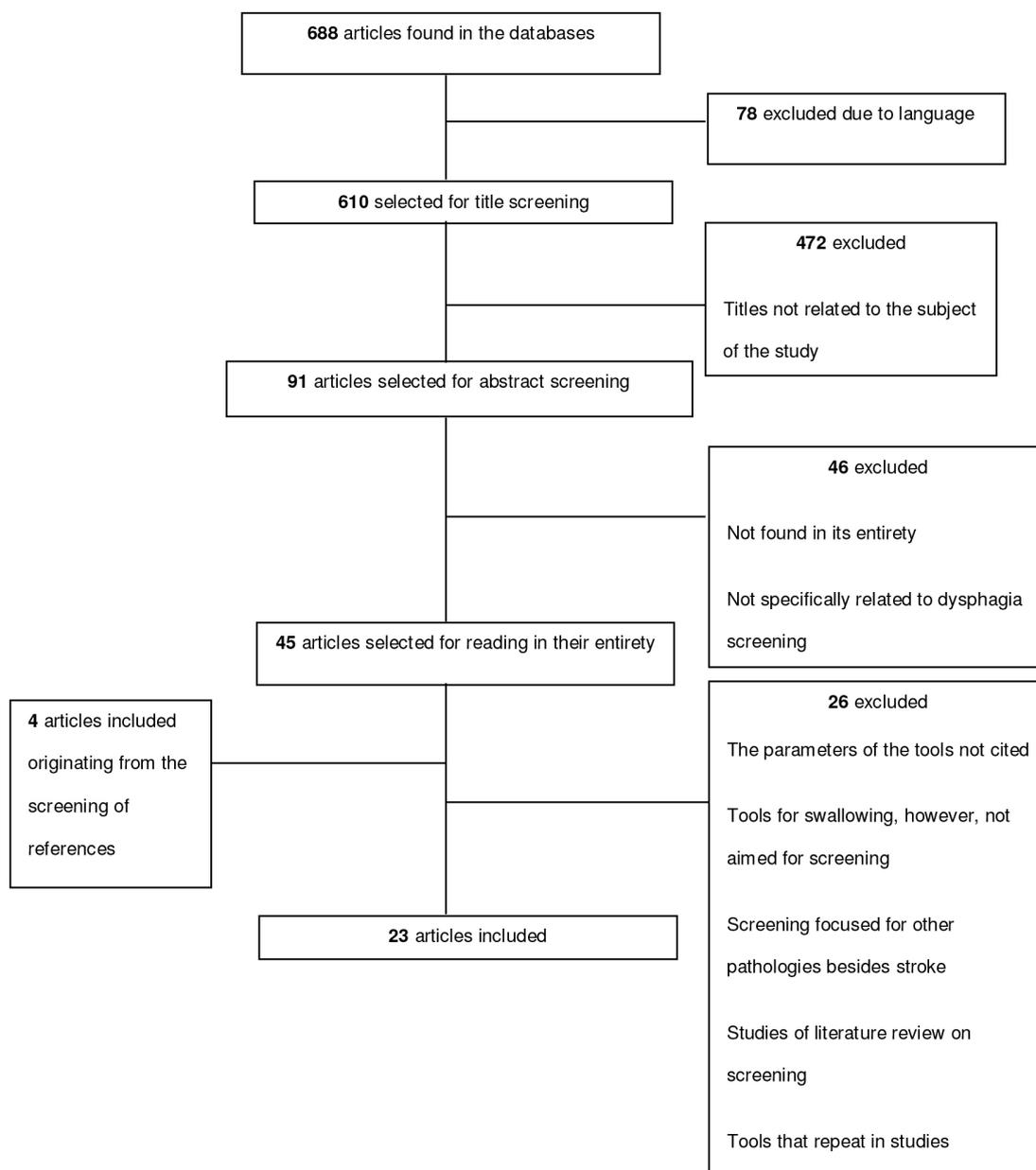
```
┌─────────────────────────────────────────┐
│ 688 articles found in the databases       │
└─────────────────────────────────────────┘
                    │
                    │         ┌──────────────────────────────┐
                    ├─────────│ 78 excluded due to language  │
                    │         └──────────────────────────────┘
┌─────────────────────────────────────────┐
│ 610 selected for title screening           │
└─────────────────────────────────────────┘
                    │
                    │         ┌──────────────────────────────┐
                    ├─────────│ 472 excluded                  │
                    │         │                               │
                    │         │ Titles not related to the subject │
                    │         │ of the study                   │
                    │         └──────────────────────────────┘
┌─────────────────────────────────────────┐
│ 91 articles selected for abstract screening │
└─────────────────────────────────────────┘
                    │
                    │         ┌──────────────────────────────┐
                    ├─────────│ 46 excluded                   │
                    │         │                               │
                    │         │ Not found in its entirety      │
                    │         │                               │
                    │         │ Not specifically related to dysphagia │
                    │         │ screening                      │
                    │         └──────────────────────────────┘
┌─────────────────────────────────────────┐
│ 45 articles selected for reading in their entirety │
└─────────────────────────────────────────┘
```

```
┌────────────────────┐                    ┌──────────────────────────────┐
│ 4 articles included │                   │ 26 excluded                   │
│ originating from the│───────────────────│ The parameters of the tools not cited │
│ screening of        │                   │                               │
│ references          │                   │ Tools for swallowing, however, not │
└────────────────────┘                   │ aimed for screening            │
                    │                     │                               │
                    │                     │ Screening focused for other    │
                    │                     │ pathologies besides stroke     │
┌─────────────────────────────────────────┐ │                               │
│ 23 articles included                       │ │ Studies of literature review on │
└─────────────────────────────────────────┘ │ screening                      │
                                            │                               │
                                            │ Tools that repeat in studies   │
                                            └──────────────────────────────┘
```

Figure 1. Stages of literature review

found, called screening, differ as to their goals, behaviors, professionals who must administer them and also as to the parameters that should compose them.

Most tools in this review presented a part involving assessment of indirect items, such as observation of clinical features and oral motor components, followed by a swallowing test with the offer of food. Some of the tools classified the severity of the swallowing disorder and defined the safest food consistency[15,18] and thus these cases ended up merging the goal known as the clinical evaluation of swallowing.

A point to be discussed is the use or not of food in oropharyngeal dysphagia screening in individuals with stroke. In this review, 90% of the tools made use of some type of food consistency, with liquid consistency the most frequently encountered, in 72.6% of the tools. Five tools[11,15,17,18,24]

included other types of consistencies, such as pasty and solid, with variations in the type of food chosen and tested volumes. Only 2 of the tools were based on clinical features[20,23].

When taking screening definitions and clinical swallowing assessment into consideration, it must be clear as to what is intended by the offer of food, namely: identification of individuals with suspected oropharyngeal dysphagia, suspicion of tracheal aspiration or the analysis of swallowing physiology to identify the possible causes of the disorder. As a result, with the offer of food, the distinction should be clear between the objectives of screening for dysphagia, screening for laryngo-tracheal aspiration and the clinical evaluation of swallowing.

In the analysis of aspects observed in studies after the offer of oral volume, we find that all 18 tools used some type of food, including the sign of cough and/or choking, and also

Chart 1. Selected studies

Selected articles	Population	Professional who administered	Tests used	Psychometric measurements/conclusions of studies
1. DePipo et al. (1992)[5]	n=44 Stroke rehabilitation phase	Speech-language pathologists	Test with water	Water sensitivity: 76% Water specificity: 59% Thickened liquid sensitivity: 94% Thickened liquid specificity: 30% Sensitivity and specificity for laryngotracheal aspiration established by videofluoroscopy.
2. DePippo et al. (1994)[6]	n=139 Stroke rehabilitation phase	Speech-language pathologists	Indirect items (questionnaire) and water test	Comparison carried out of tool with developing pneumonia, airway occlusion and death. Risk of developing complications was 7.65 times greater in individuals who failed than in individuals who passed
3. Smithard et al. (1996, 1997, 1998)[1,7,8]	n=94 Acute phase - up to 24h. of stroke diagnosis	Physicians and speech-language pathologists	Indirect items and water test	Sensitivity: 47% speech-language pathologist 70% physician Specificity: 86% speech-language pathologist 66% physician reliability varied between physician and speech-language pathologist $\kappa = (0.24\text{-}0.79)$ Sensitivity and specificity for dysphagia. Comparison established by videofluoroscopy. Lack of defining criteria used in considering the presence of dysphagia in the exam.
4. Daniels et al. (1997)[9]	n=59 Acute phase - up to 5 days after stroke diagnosis	Speech-language pathologists	Indirect items and water test	Sensitivity: 92% Specificity: 67% 2 to 6 clinical characteristics Comparison established by videofluoroscopy. Sensitivity and specificity for laryngotracheal aspiration and penetration and not for dysphagia. The presence of laryngotracheal aspiration and penetration as well as severity was classified according to the frequency of penetrations/aspirations and quantity of aspirate consistencies observed in the exam.
5. Hinds and Wiles (1998)[10]	n=115 Acute phase - up to 72h of stroke diagnosis	Physicians	Indirect items (questionnaire) and water test	Sensitivity: 97% Specificity: 69% Comparison based on clinical characteristics suggestive of dysphagia, such as: Need of SLP intervention, dietary changes, respiratory complications and death.
6. Westergren et al. (1999)[11]	n=160 Acute phase	Nurses	Indirect items and test with processed milk (thickened consistency) and water	Authors concluded that 77% of subjects were identified with dysphagia. Diagnostic confirmation was performed by clinical evaluation of swallowing. Lack of defining criteria used in considering the presence of dysphagia.

Chart 1. Selected studies (cont.)

Selected articles	Population	Professional who administered	Tests used	Psychometric measurements/conclusions of studies
7. Perry (2001) [12]	n=123 Acute phase	Nurses Speech-language pathologists Physicians	Indirect items and water test	Sensitivity: 97% Specificity: 90% Positive predictive value (PPV): 0.92 Negative predictive value (NPV): 0.96 Comparison based on clinical indicators, as reports of swallowing difficulty described by the team, found in patients' medical records.
8. Massey and Jedlicka (2002) [13]	n=25 Acute phase - up to 48h of stroke diagnosis	Nurses	Indirect items and water test	Sensitivity: 100% Specificity: 100% Comparison based on clinical data from medical records that indicated the presence or lack of presence of dysphagia. Dysphagia was determined by the need of SLP therapy, need of dietary adaptation and lung infection.
9. Nishiwaki et al. (2005) [14]	n=61 Patients with a diagnosis of stroke varied from 1 month to 3 months from stroke diagnosis	Physicians Speech-language pathologists	Indirect items and water test	Obtained results were compared with videofluoroscopy, which determined dysphagia by: oral phase changes (sluggish, escape or incoordination) or pharyngeal phase changes (aspiration, pharyngeal response delay and residue). Aspiration was defined as the entry of foods below the vocal folds. Indicated that only the variable cough and change in vocal quality were significantly associated with aspiration, with a sensitivity of 72% and specificity of 67%
10. Trapl et al. (2007) [15]	n=50 Acute phase - up to 24h of stroke diagnosis	Speech-language pathologists Nurses	Indirect items and test with processed milk (thickened consistency) and water	Speech-language pathologist: Sensitivity: 100% Specificity: 50% NPV: 100% Nurse: Sensitivity: 100% Specificity: 69% NPV:100% sensitivity and specificity for the presence of laryngotracheal aspiration established by nasal endoscopy exam.
11. Turner-Lawrence et al. (2009) [16]	n=84 Acute phase - up to 24h of stroke diagnosis	Physicians	Indirect items (questionnaire) and water test	Sensitivity: 96% Specificity: 56% Reliability: 97% Comparison established by clinical evaluation of swallowing. Dysphagia considered with the need of dietary changes after SLP assessment.
12. Bravata et al. (2009) [17]	n=101 Stroke phase not reported	Nurses	Indirect items and consistencies not reported but signs after swallowing reported.	Tool compared with NIH Stroke Scale (NIHSS). Reported 29% sensitivity and 84% specificity to detect dysphagia, which considered swallowing changes in solid and/or liquid as: changes in oral phase delay not considered dysphagia. The NIHSS, when compared to SLP assessment, had sensitivity of 79% and specificity of 68% concluded that the NIHSS had better dysphagia screening characteristics than the elaborated tool.

Chart 1. Selected studies (cont.)

Selected articles	Population	Professional who administered	Tests used	Psychometric measurements/conclusions of studies
13. Courtney and Flier (2009)[18]	Not applied	----------	Indirect items and test with multiple consistencies: applesauce, juice and cracker	Study related only the importance of screening tool implementation and psychometric measurements were not cited.
14. Martino et al. (2010)[19]	n=311 108 patients in acute phase and 208 in stroke rehabilitation phase	Nurses	Indirect items and water test	Sensitivity 91.3% and NPV 93.3% in stroke acute phase and 89.5% in rehabilitation phases. Specificity: 67% Reliability: intraclass correlation coefficient 92% Sensitivity and specificity, determined to dysphagia, considered any change in swallowing physiology, including aspiration, and the diagnosis was determined by 4 SLP therapists in the analysis of videofluoroscopy.
15. Antonios et al. (2010)[20]	n=150 Acute phase - up to 89h of stroke diagnosis	Physicians	Indirect items	Sensitivity: (Neurologist 1: 92%, Neurologist 2: 87%), Specificity: (Neurologist 1: 86.3%, Neurologist 2: 84.2%) PPV: (Neurologist 1: 79.4%, Neurologist 2: 75.8%) NPV (Neurologist 1: 95.3%, Neurologist 2: 92%) Reliability: $\kappa=0.76$ Sensitivity and specificity for dysphagia, which used the scoring of the *Mann Assessment of Swallowing Ability* (MANN) clinical assessment tool, was lower than 178.
16. Edmiaston et al. (2010)[21,22]	n=300 Acute phase - mean of 8h of stroke diagnosis	Nurses	Indirect items and water test	Study 1 Sensitivity/dysphagia: 91% Specificity/dysphagia: 74% Sensitivity/aspiration: 95% Specificity/aspiration: 68% PPV: 54% NPV: 95% Dysphagia was considered if the score of MASA was less than 178. A score less than 170 was consideration for a risk of laryngotracheal aspiration
	n=225 Acute phase			Study 2 Sensitivity/dysphagia: 94% Specificity/dysphagia: 66% PPV: 71% NPV: 93% Reliability: $\kappa=93.6$ Sensitivity/aspiration: 95% Specificity/aspiration: 50% Compared with videofluoroscopy and The Dysphagia Outcomes Severity Scale (DOSS) was used for dysphagia classification.
17. Schrock et al. (2011)[23]	n=283 Application phase not reported	Nurses	Indirect items	Sensitivity: 96% Specificity: 56% Reliability: 97% Sensitivity and specificity for dysphagia was determined by observing the patient for 30 days after hospital admission, considering dysphagia: videofluoroscopy needed with altered result, needed alternative feeding pathway and dietary changes after SLP assessment.

Chart 1. Selected studies (cont.)

Selected articles	Population	Professional who administered	Tests used	Psychometric measurements/conclusions of studies
18. Barnard (2011)[24]	Not applied	---------	Indirect items and test with multiple consistencies: applesauce and water	Study cited the tool, explaining the importance of a screening tool in dysphagia management. Application phase not reported.
19. Zhou et al. (2011)[25]	n=107 Acute phase - up to 48h of stroke diagnosis	Physicians	Indirect items and water test	Tool is based on a battery of tests: 3oz WT and CPSA test Sensitivity: 89.1% Specificity: 80.8% sensitivity and specificity for aspiration defined in videofluoroscopy with entrance of food below vocal fold.
20. Daniels et al. (2013)[26]	Not applied	-----------	Indirect items and water test	Refers on to implementation steps, with improvement in dysphagia screening after tool implementation, however, no data on its application.

Chart 2. Frequency of aspects discussed of screening tools for oropharyngeal dysphagia in stroke patients according to literature review

Items unrelated to offer of food	Frequency of items in the study (n=20)	Items related to offer of food	Frequency of items in the study (n=20)
Level of alertness / attention	65% (13)	Cough/choke/throat clearing	90% (18)
Vocal quality	65% (13)	Wet voice	70% (14)
Saliva swallowing	50% (10)	Extra-oral escape/labial sealing deficit	25% (5)
Forced cough	45% (9)	Difficulty in swallowing	20% (4)
Gag reflex	40% (8)	Oral residue	15% (3)
Speech	35% (7)	Respiratory distress/drop in oxygen saturation	15% (3)
Movement/tongue force	35% (7)	Multiple swallows	5% (1)
Swallowing complaints	30% (6)	Delayed pharyngeal response	5% (1)
Movement/palate symmetry	30% (6)	Reduced laryngeal elevation	5% (1)
Movement/facial symmetry	25% (5)	Prolonged meal	5% (1)
Aphasia/comprehension/expression	20% (4)	Pain when swallowing	5% (1)
Breathing/fatigue	15% (3)	Nasal Reflux	5% (1)
Movement/labium symmetry	15% (3)	-	-
Control of head and trunk	15% (3)	-	-
History of pneumonia	10% (2)	-	-
Cooperation/collaboration	5% (1)	-	-
History of tracheal intubation	5% (1)	-	-
Stroke severity/location	5% (1)	-	-
Reduction prior to oral intake/use of alternative feeding pathway	5% (1)	-	-

often used the sign of wet voice, found in 70% of tools and less frequent aspects not directly related to laryngotracheal aspiration and penetration, as extra-oral escape, oral residue, prolonged meal time, among others. Thus, the frequent use of water and the observation of clinical signs suggestive of laryngotracheal aspiration and penetration make us think that the tools are more focused towards identifying individuals with suspected laryngotracheal aspiration and not for oro-pharyngeal dysphagia[5,9,14,15]. Only a few studies verified the sensitivity and specificity of the result of the instrument for dysphagia[19,20]. Therefore, the presence of high sensitivity in the results of the tools for laryngotracheal aspiration is not the same for dysphagia because individuals may not be identified in the screening test and be dysphagic with a lower degree of compromise.

The parameters unrelated to the offer of food have also been multiple and variable, often the parameters found being related mainly to alertness, voice quality associated with the ability of airway protection and the observation of saliva swallowing. Others parameters found, but less frequent, were

forced cough, gag reflex, aspects of speech and language, movement and strength of orofacial structures, respiratory aspects, questionnaires aimed at swallowing complaints and risk factors for dysphagia.

In the literature, the use of factors unrelated to the offer of food in oropharyngeal dysphagia screening is restricted, as the use of foods is frequently employed. Water, associated with signs of penetration and/or aspiration, offers according to the literature, more promising results in screening for dysphagia and has higher levels of sensitivity and specificity. Oral motor mechanisms have been identified as parameters without evidence for dysphagia screening[28]. However, other studies have found an association between some clinical indicators with oropharyngeal dysphagia and/or laryngotracheal aspiration[29,30] and the correct identification of dysphagia patients improved when the isolated swallowing test was associated with clinical features such as dysarthria, dysphonia, gag reflex deficit and cough[9]. One of the tools selected in this review, making use only of clinical features[20], showed good sensitivity and specificity for the identification of oropharyngeal dysphagia. In the overall analysis of the results of sensitivity and specificity of the tools in this review, a variation of 47-100% in sensitivity and 30-100% in specificity was found, making it possible to observe excellent values, both in tools that used only clinical criteria and those who were associated with the offer of food consistencies. Nevertheless, it was not possible to determine the most sensitive or specific tool due to methodological differences among the studies. These differences mainly involved the number of individuals, the tests used, the definition of the construct, that is, the investigated outcome (dysphagia, laryngotracheal aspiration or both, for example), in addition to the stroke stage in which the tool was applied. Most tools were applied in the acute phase, however, the time ranged from hours to months, which may have impacted sensitivity and specificity, as observed in one of the tools[19] that was applied both in the acute and rehabilitation phases and found better sensitivity in the acute phase of stroke.

Another controversial point in the studies reviewed was in relation to the professionals who administered the screening. Of the 17 tools that cited application, six were administered by nurses[11,13,17,19,21,23], four by physicians[10,16,20,25], four by different professionals (speech-language pathologists, physicians and nurses)[1,7,8,12,14,15] and three by speech-language pathologists[5,6,9]. We feel that screening for oropharyngeal dysphagia should be performed early and it is extremely important that all professionals be trained. However, the diagnosis must be confirmed by the evaluation of a professional who specializes in swallowing, and in Brazil, that is the speech-language pathologist.

The literature presents multiple tools for the screening of oropharyngeal dysphagia in stroke, as there is no consensus among the parameters, objectives and concepts or on who should apply it, but there is scientific evidence of the benefits of implementing a screening program regardless of the method used when compared to locations where no formal screening is used[31].

Importantly, although there is no consensus among existing direct and indirect parameters in these tools, some were present in more than 50% of the studies.

Dysphagia screening is extremely important, however, it is necessary when choosing an instrument or in the elaboration of a new tool, that important attributes are observed, namely, the validation process, reliability, and good sensitivity and specificity for what you want to find[2].

In the current context, these measurements may still be considered flaws in most of the tools found in our review of the screening tools for swallowing disorders in the adult stroke population.

We also believe that the concepts of screening and assessment should be better defined and discussed at more length and for dysphagia screening and not only laryngotracheal aspiration, it is necessary to integrate among the risk factors for dysphagia the clinical and oral motor features, aspects related to cognitive-linguistic performance, in addition to signs indicating dysphagia observed during oral intake.

CONCLUSION

There is no consensus among studies of the parameters that should compose the method of screening for oropharyngeal dysphagia in the adult stroke population. There is also no differentiation between the concepts of screening and evaluation of dysphagia in some of the tools found in the literature. Thus, further studies are needed that will take into account this theoretical framework, aimed at the construction of new tools for the screening of oropharyngeal dysphagia in the adult stroke population.

REFERENCES

1. Smithard DG, O'neill PA, Park CL, Morris J, Wyatt R, England R et al. Complications and outcome after acute stroke does dysphagia matter? Stroke.1996;27(7):1200-4. http://dx.doi.org/10.1161/01.STR.27.7.1200

2. Donovan NJ, Daniels SK, Edmiaston J, Weinhardt J, Summers D, Mitchell PH. Dysphagia screening: state of the art invitational Conference Proceeding From the State-of-the-Art Nursing Symposium, International Stroke Conference 2012. Stroke. 2103;44(4):e24-31. http://dx.doi.org/10.1161/STR.0b013e3182877f57

3. Kertscher B, Speyer R, Palmieri M, Plant C. Bedside screening to detect oropharyngeal dysphagia in patients with neurological disorders: an updated systematic review. Dysphagia. 2014;29(2):204-12. http://dx.doi.org/10.1007/s00455-013-9490-9

4. American Speech-Language-Hearing Association. Preferred practice patterns for the profession of speech-language pathology [Preferred

practice patterns]. Rockvile: American Speech-Language-Hearing Association; 2004 [citado: 2 dez 2014]. Available from: http://www.asha.org/policy/PP2004-00191/

5. DePippo KL, Holas MA, Reding MJ. Validation of the 3-oz water swallow test for aspiration following stroke. Arch Neurol. 1992;29(12):1259-61. http://dx.doi.org/10.1001/archneur.1992.00530360057018

6. DePippo KL, Holas MA, Reding MJ. The Burke dysphagia screening test: validation of its use in patients with stroke. Arch Phys Med Rehabil. 1994;75(12):1284-6.

7. Smithard DG, O'Neill PA, Park C, England R, Renwick DS, Wyatt R et al. Can bedside assessment reliably exclude aspiration following acute stroke? Age Ageing. 1998;27(2):99-106. http://dx.doi.org/10.1093/ageing/27.2.99

8. Smithard DG, O'Neill PA, England RE, Park CL, Wyatt R, Martin DF et al. The natural history of dysphagia following a stroke. Dysphagia. 1997;12(4):188-93. http://dx.doi.org/10.1007/PL00009535

9. Daniels SK, McAdam CP, Brailey K, Foundas AL. Clinical assessment of swallowing and prediction of dysphagia severity. American Journal of Speech-Lang Pathol. 1997;6(4):17-24. http://dx.doi.org/10.1044/1058-0360.0604.17

10. Hinds NP, Wiles CM. Assessment of swallowing and referral to speech and language therapists in acute care. Q J Med. 1998;91(12):829-35. http://dx.doi.org/10.1093/qjmed/91.12.829

11. Westergren A, Hallberg IR, Ohlsson O. Nursing assessment of dysphagia among patients with stroke. Scand J Caring Sci. 1999;13(4):274-82. http://dx.doi.org/10.1111/j.1471-6712.1999.tb00551.x

12. Perry L. Screening swallowing function of patients with acute stroke: part one: identification, implementation and initial evaluation of a screening tool for use by nurses. J Clin Nurs. 2001;10(4):463-73. http://dx.doi.org/10.1046/j.1365-2702.2001.00501.x

13. Massey R, Jedlicka D. The massey bedside swallowing screen. J Neurosci Nurs. 2002;34(5):252-60. http://dx.doi.org/10.1097/01376517-200210000-00005

14. Nishiwaki K, Tsuji T, Liu M, Hase K, Tanaka N, Fujiwara, T. Identification of a simple screening tool for dysphagia in patients with stroke using factor analysis of multiple dysphagia variables. J Rehabil Med. 2005;37(4):247-51. http://dx.doi.org/10.1080/16501970510026999

15. Trapl M, Enderle P, Nowotny M, Teuschl Y, Matz K, Dachenhausen A et al. Dysphagia bedside screening for acute-stroke patients. The Gugging Swallowing Screen. Stroke.2007;38(11):2948-52. http://dx.doi.org/10.1161/STROKEAHA.107.483933

16. Turner-Lawrence DE, Peebles M, Price MF, Singh SJ, Asimos AW. A feasibility study of the sensitivity of emergency physician dysphagia screening in acute stroke patients. Ann Emerg Med. 2009;54(3):344-8.e1. http://dx.doi.org/10.1016/j.annemergmed.2009.03.007

17. Bravata DM, Daggett VS, Woodward-Hagg H, Damush T, Plue L, Russell S et al. Comparison of two approaches to screen for dysphagia among acute ischemic stroke patients: nursing admission-screening tool versus National Institutes of Health stroke scale.

Rehabil Res Dev. 2009;46(9):1127-34. http://dx.doi.org/10.1682/JRRD.2008.12.0169

18. Courtney BA, Flier LA. RN dysphagia screening, a stepwise approach. J Neurosci Nurs. 2009;41(1):28-38. http://dx.doi.org/10.1097/JNN.0b013e31819345ac

19. Martino R, Silver F, Teasell R, Bayley M, Nicholson G, Streiner DL et al. The Toronto bedside swallowing screening test (TOR-BSST) development and validation of a dysphagia-screening tool for patients with stroke. Stroke. 2009;40(2):555-61. http://dx.doi.org/10.1161/STROKEAHA.107.510370

20. Antonios N, Carnaby-Mann G, Crary M, Miller L, Hubbard H, Hood K et al. Analysis of a physician tool for evaluating dysphagia on an inpatient stroke unit: the modified mann assessment of swallowing ability. J Stroke Cerebrovasc Dis. 2010;19(1):49-57. http://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2009.03.007

21. Edmiaston J, Connor LT, Loehr L, Nassief A. Validation of a dysphagia screening tool in acute stroke patients. Am J Crit Care. 2010;19(4):357-64. http://dx.doi.org/10.4037/ajcc2009961

22. Edmiaston J, Connor LT, Steger-May K, Ford AL. Simple bedside stroke dysphagia screen, validated against videofluoroscopy, detects dysphagia and aspiration with high sensitivity. J Stroke Cerebrovasc Dis. 2014;23(4):712-716. http://dx.doi.org/10.1016/j.jstrokecerebrovasdis.2013.06.030

23. Schrock JW, Bernstein J, Glasenapp M, Drogell K, Hanna J. A novel emergency department dysphagia screen for patients presenting with acute stroke. Acad Emerg Med. 2011;18(6):584-9. http://dx.doi.org/10.1111/j.1553-2712.2011.01087.x

24. Barnard SL. Nursing dysphagia screening for acute stroke patients in the emergency department. J Emerg Nurs. 2011;37(1):64-7. http://dx.doi.org/10.1016/j.jen.2010.11.002

25. Zhou Z, Salle J, Daviet J, Stuit A., Nguyen C. Combined approach in bedside assessment of aspiration risk post stroke: PASS. Eur J Phys Rehabil Med. 2011;47(3):441-6.

26. Daniels SK, Anderson JA, Petersen NJ. Implementation of stroke dysphagia screening in the emergency department. Nurs Res Pract. 2013;2013:ID 304190. http://dx.doi.org/10.1155/2013/304190

27. Ministério da Saúde (BR), Secretaria de Atenção à Saúde, Departamento de Atenção Básica. Rastreamento. Brasília, DF: Ministério da Saúde, 2010. (Série a. Normas e manuais técnicos. Cadernos de atenção primária, n. 29).

28. Bours GJ, Speyer R, Lemmens J, Limburg M, De Wit R. Bedside screening tests vs. videofluoroscopy or fibreoptic endoscopic evaluation of swallowing to detect dysphagia in patients with neurological disorders: systematic review. J Adv Nurs. 2009;65(3):477-93. http://dx.doi.org/10.1111/j.1365-2648.2008.04915.x

29. Logemann JA, Veis S, Colangelo LA. Screening procedure for oropharyngeal dysphagia. Dysphagia. 1999;14(1):44-51. http://dx.doi.org/10.1007/PL00009583

30. McCullough GH, Wertz RT, Rosenbek JC. Sensitivity and specificity of clinical/bedside examination signs for detecting aspiration in adults subsequent to stroke. J Commun Disord. 2001;34(1-2):55-72. http://dx.doi.org/10.1016/S0021-9924(00)00041-1

31. Hinchey JA, Shephard T, Furie K, Smith D, Wang D, Tonn S. Formal dysphagia screening protocols prevent pneumonia. Stroke. 2005;36(9):1972-6. http://dx.doi.org/10.1161/01. STR.0000177529.86868.8d