Clinical Nutrition ESPEN 33 (2019) 86–90

Contents lists available at ScienceDirect

Clinical Nutrition ESPEN

journal homepage: http://www.clinicalnutritionespen.com

Original article

Prevalence of dysphagia in a regional hospital setting: Acute care hospital and a geriatric sociosanitary care hospital: A cross-sectional study

Amaya Peñalva-Arigita [a, *], Rosa Prats [a], Maria Lecha [a], Anna Sansano [a], Lluis Vila [b]

[a] Dietitians of Hospital Moisès Broggi, St. Joan Despí & Hospital General of Hospitalet, (Consorci Sanitari Integral), Barcelona, Spain
[b] Endocrinologist, Head of Endocrinology and Nutritiona Unit of Hospital Moisès Broggi, St. Joan Despí & Hospital General of Hospitalet, (Consorci Sanitari Integral), Barcelona, Spain

ARTICLE INFO

Article history:
Received 18 June 2019
Accepted 8 July 2019

Keywords:
Prevalence
Dysphagia
Sociosanitary
Malnutrition

SUMMARY

Rationale: Oropharyngeal Dysphagia (OD) is a symptom commonly found in hospitalized patients and related to a vast array of clinical diagnosis and to high morbidity and mortality that is becoming very important to identify. Our aim was to assess the prevalence of OD in our hospital setting.
Methods: Cross-sectional randomized study to determine the prevalence of dysphagia in an acute care hospital (ACH) and long term care hospital (LTCH). Multiquestionnaire test performed to assess dysphagia with the bedside validated volume-viscosity swallow test (V-VST test), in those with the validated swallowing ability test, eating assessment tool (EAT-10)>3. *Variables;* sex, age (>65 y), diagnosis, mininutritional assessment (MNA), previous diagnosis of dysphagia (including any recommendations given before), EAT-10, V-VST, presence of dysphagia, type of diet prescribed (basal or therapeutic), use of thickener and diet texture (pureed with liquids allowed, pureed without liquids, soft diet, normal).
Results: N = 200 patients (100 in each centre). 49% male; Age = 81.1 [65–101] years; Diagnostics: medical 70%/surgery 30%. Dysphagia analysis: 42% patients showed an EAT-10 > 3 so the V-VST test was done in these patients resulting in global prevalence of 28.5% (95% CI: 22.7–35.1). Among centres no significant differences were observed: ACH 30% (95% CI: 14–34) and LTCH 27% (95% CI: 19–36). Highlighting a greater concentration of dysphagia in Orthogeriatric and Neurological patients in the LTCH than in ACH (Pneumology, Internal Medicine and Cardiology). MNA analysis: 27% normal 44% risk 29% malnutrition. Malnutrition present in 50.9% of patients diagnosed with dysphagia, 44% in those at risc (EAT-10 +) and 27.6% in those without risc or dysphagia (p = 0.020).
From the novo patients, 75.4% did not have adequate complete adapted treatment (diet and thickener). Only 13.3% had their thickener prescribed. In those with history of dysphagia 37% had an inappropriate treatment.
Conclusion: Prevalence of OD matches with what is described in the literature. There is a high proportion of infradiagnostic and overall inadequate treatment, more than a third of patients do not have their diet adapted correctly. It is important to identify this symptom to treat it properly and to raise awareness among sanitary professionals for best adaptation of treatment.

1. Introduction

Dysphagia is defined as the disorder that affects the ability to swallow solid, semi-solid and/or liquid foods due to a deficiency in any of the stages of swallowing. It is becoming a common problem as 1 in 17 people have some form of dysphagia throughout their lives [1].

* Corresponding author. Nutritional & Dietetics Unit, Hospital Moisses Broggi, Jacint Verdaguer 90, Sant Joan Despí, Barcelona, 08970, Spain.
E-mail address: apenalvaa@csi.cat (A. Peñalva-Arigita).

https://doi.org/10.1016/j.clnesp.2019.07.003

Dysphagia is frequently associated with complications of bronchoaspiration, dehydration and malnutrition, and may result in a fatal outcome. It is also linked with an increase in the use of hospital resources by associated cost of greater number of hospital admissions, use of medication, days of hospitalization, tests, consultations, etc[2,3].

In spite of this, in most cases, it is still underdiagnosed and undertreated, and rarely are the most frequent problems of malnutrition and pneumonia associated or mentioned.

Also, the costs, directly or indirectly resulting from dysphagia, are not analysed sufficiently, with prolonged hospitalizations, interventions for diagnosis and treatment of associated complications [5].

There are few studies that detail the prevalence of dysphagia. The recorded data may vary according to different variables; the definition of dysphagia that is applied, the moment in which a patient is studied (with a certain pathology associated), and especially the methods used for diagnosis. In addition, it is described a 60% of under diagnosis of dysphagia and 66% of cases are allowed to evolve without treatment, even in clinical settings that provide specialized care for older adults [6].

Dysphagia is frequently found in patients with neurodegenerative diseases with a described prevalence of 80%. There are published data of 100% prevalence in bulbar ELAS and 60% in the rest of its clinical forms [7,8]. In multiple sclerosis 45%, and in patients with Parkinson's 35–45% [8]. In this last pathology we find percentages up to 82% [9] and more recently up to 87% [10]. In Alzheimer's dementias there are described figures of 84% [11,12]. In patients who have had a stroke, the percentages described vary from 40% in acute phases, to 6% in chronic phases [8,9], reaching figures of 67%–90% during the first three days of illness [13,14]. In stroke patient's dysphagia improves in most patients during the first 10 days and the final resolution percentage varies between 45% and 70% [9]. However, after 3 months between 10% and 30% maintain symptoms of dysphagia [13]. It should must be borne in mind that 64–90% are diagnosed in the acute phases and 22–42% aspiration is found within this range. The risk of pneumonia is seven times higher in patients with stroke who aspire, compared with those who do not aspire [15].

In traumatic brain injury the range is between 25% and 61% [16]. In addition, 80% of patients who have received surgical or radiotherapy treatment have swallowing problems [17] and 44%–87% of patients who have been intubated develop swallowing disorders [3].

In the general population, there is data on dysphagia in 1.7%–11.3% [18]. There are epidemiological studies that suggest the presence of swallowing problems in 22% of people over 50 years of age [5].

Dysphagia is a predominantly a geriatric symptom, affecting approximately 40% of people older than 65 years [9]. It is also associated with increasing in patients $\geq$80 years [19].

As indicated, the prevalence data are variable. The figures described in the community vary from 11% [20] to 25% [21]. The figures increase in institutionalized people ranging from 30% to 60% [8] to 78%–80% [13,22]. In a recent multicenter study in the Spanish population, with a sample of 2384 patients, the percentage in institutionalized patients is 70% [4].

In hospitalized situations the percentages reported reach up to 44% of the elderly admitted [21]. In general, the described ranges of hospitalized patients are 12–30% [3]. In Spain there is data showing 15% [23] that increases to 42.5% when the diagnostic technique is more accurate [24]. Other studies of 440 patients studied during acute hospitalization processes show figures of 31.8% [25]. This data is collected from various studies in hospitals and residences, but we lacked specific data in our environment, and for this reason we have conducted this study to determine the prevalence of dysphagia in both the acute hospital and the long-term care hospital.

2. Methodology of the study

Cross-sectional study to determine the prevalence of dysphagia during 7 months (1st of March 2013 to 31st of October 2013).

Randomly chosen patients from two centres included: Moisès Broggi Hospital (acute care hospital) (ACH) and the Long-term care Hospital of Hospitalet General Hospital (LTCH).

To calculate the sample of both centres we took into account a prevalence of dysphagia of 40% in patients over 65 years of age admitted with an accuracy of 10%, so it was necessary to assess 100 randomly selected patients who met all the criteria of inclusion and no exclusion criteria.

Inclusion criteria:

- Patients admitted to Moisés Broggi Hospital or the Hospital Sociosanitari d'Hospitalet, of both sexes.
- Patients older than or equal to 65.
- Patients with oral intake
- Patients with a level of consciousness between 1 and 3 [26], which would allow us to perform the volume-viscosity test (V-VST test) to confirm dysphagia.
- To have signed the informed consent.

In the event that the patient could not sign it, it is admissible to obtain consent from the person who lives with and cares for the patient. This is mainly as it is a descriptive study with minor research. The study does not imply implicit hospital admission, general anesthesia, deep sedation, or ostensibly affecting a vital prognosis.

Exclusion criteria:

- Patients nil by mouth (no oral diet and/or with total Parenteral Nutrition)
- Patients with level of consciousness 4 and 5.
- Patients under 65 years of age.

Procedure:

A random selection of 5 patients was made every week from the income census, using a program that generates random numbers without repetition ("NoSetup Programs®"). The selected patients underwent a first visit to assess their inclusion. If they were selected, the informed consent form was provided to the patient or legal guardian/caregiver.

Each patient filled out a form created for this purpose that contains the main variables related to dysphagia and nutritional status.

Primarily each patient was screened using the specific dysphagia screening tool EAT-10 [27,34], to identify risk or presence of dysphagia. Then when positive, the V-VST test, a clinical diagnostic method for dysphagia developed by [17] was performed.

Likewise, the nutritional evaluation data was collected using the MNA [28]; also collected was the type of diet already given in the hospital including the use of thickener for liquids.

The present study was approved by the ethical comitte of the Consorcio Sanitari Integral, CSI, which embraces the two settings; Moisès Broggi Hospital (acute care hospital) (ACH) and the Long-term care Hospital of Hospitalet General Hospital (LTCH).

3. Variables to be studied

Descriptive: Sex, age, service responsible for admission to ACH and in the LTCH.

Nutritional: Current weight, usual weight, BMI, Mini Nutritional Assessment (MNA®), type of diet prescribed (basal or therapeutic), texture of the diet (pureed with liquids allowed, pureed without liquids, soft diet, normal), use of commercial food thickener.

Dysphagia: History of dysphagia, Eating Assessment Tool questionnaire (EAT-10), Clinical viscosity volume exploration method (V-VST) for clinical diagnosis dysphagia.

4. Results

The total sample was 200 patients (100 in each centre). 49% were men and 51% were women, with an average age of 81.1 ± 8.3 [65–101] years, without significant differences between both centres. They presented a positive EAT-10 screen in 51% (95% CI: 44–58) of the total cases (102/200), without finding significant differences between both centers: ACH 42% (95% CI: 33–52%) and LTCH 60% (95% CI: 14–34%).

Out of these 102 with EAT 10 positive; 57 were diagnosed with dysphagia by the volume-viscosity swallow test (V-VST test), which results in a global prevalence of 28.5% (95% CI: 22.7–35.1).

Among centres no significant differences were observed: ACH 30% (95% CI: 14–34) and LTCH 27% (95% CI: 19–36).

The distribution of the sample by medical services responsible for admission is shown in Table 1. The distribution of the initial medical services between the two centers was significantly different ($p < 0.001$), highlighting a greater concentration of dysphagia in Orthogeriatric and Neurological patients in the LTCH, and, Pneumology, Internal Medicine and Cardiology patients in the case of the ACH.

The same table shows the patients with positive screening and the percentage of those who were diagnosed with dysphagia, obtaining significant differences between patients according to the medical service at admission ($p = 0.034$), highlighting as mentioned, a higher prevalence of dysphagia among patients admitted to hospital in the Neurology and Pneumology departments.

Out of the total patients studied 18% (36/200) had already been identified as dysphagic and the patient informed of it in some occasion prior to admission. Out of these 18%; 94.4% (34/36) had a positive EAT-10 and dysphagia was confirmed in 75% of these cases (27/34). This represents the 47.4% (27/57) of all the patients studied; 52.6% were patients identify *de novo* (30/57).

In relation to the nutritional status of all patients: 38% (95% CI: 31–44) had malnutrition, 41.5% (95% CI: 35–48) risk of malnutrition and 20% (95% CI: 15–26) were well nourished. In the LTCH the prevalence of malnutrition was higher than in ACH, 46% (95% CI: 36–56) vs 30% (95% CI: 11–20) ($p = 0.022$).

Patients diagnosed with dysphagia had 50.9% malnutrition and those who had a positive EAT-10, but without confirmed dysphagia, presented 44% malnutrition (NS). However, both groups differed significantly from the group without risk of dysphagia, with a prevalence of malnutrition of 27.6% ($p = 0.020$).

The majority were on therapeutic diets 74% (148/200) vs 26% basal diets. The distribution of the scheduled diets in the studied patients can be seen in Table 2. From the 27 patients with a history of dysphagia that were indeed dysphagic patients, (confirmed in our study), almost half (14 cases) followed a completely adapted diet (pureed) plus a commercial food thickener for liquids.

The remaining 13 followed diferent diets but from these only 3 had the liquids thickened. Thirty seven percent of patients had a deficient adaptation of the dietary treatment.

In the cases diagnosed *de novo* (30) only in 13.3% (4/30) of the cases, liquids were thickened for the control of dysphagia and from these 10 (33.3%) had no liquid modification at all. In total there was a 75,4% (43/57) patients with dysphagia diagnosed in this study without an adequate complete dietary treatment (adapted diet plus thickener).

5. Discussion

Aspiration worsens the patients' situation to the point of even causing death from pneumonia. In fact, aspiration is the main cause of morbidity and mortality in hospitalized or institutionalized elderly [15,29]. This, in many cases has been related to dysphagia and although there may be other factors that lead to pneumonia, about 50% of cases of pneumonia are caused by aspiration and 50% of them die [30]. The main objective of the study was to know the prevalence of dysphagia in our centres. The Integral Sanitari Consortium of the Baix Llobregat Area covers a population of approximately 430,000 inhabitants. The health care is carried out by the Hospital of Sant Joan Despí Moisès Broggi, an acute care hospital (ACH), and the General Hospital of Hospitalet, the latter being basically a longterm care hospital (LTCH). We have found a 28% global prevalence of dysphagia, (30% in ACH and 27% in LTCH), which agrees with some of the figures described in the literature in patients hospitalized with ranges established between 12 and 30% [3].

Regarding the treatment there is a lot of variability between hospitals since there are no generalized protocols, but a preventive treatment is commonly used. This consists of adopting safety measures for swallowing by adapting the diet to the appropriate texture and, adequating líquids to the allowed viscosity using an commercial food thickener. Finally, an enteral nutritional support is offered when there is no functioning oral route. Thus, modifying the texture of foods and fluids is essential [39]. It is proven that early intervention after an ictus are an important pillar of the recovery from dysphagia and to prevent associated complications [31] therefore its diagnosis is essential, if it is not diagnosed, patients are in many cases not aware of the swallowing problems they suffer [32]. Related to this, an important aspect of the study is also

Table 1
General findings on confirmed dysphagia (EAT-10 + V-VST). Distribution by Medical Specialties (EAT-10: Eating Assessment Tool questionnaire; V-VST: Clinical viscosity volume exploration method; ACH: Acute care Hospital; LTCH: Long term care hospital).

Specialties	Admissions by Medical Specialties			Patients with positive EAT-10 N (%)	Patients with Disfagia N (%)
	ACH	LTCH	Total (%)		
Oncology	15	12	27 (13,5)	14 (51.9)	6 (22.2)
Orthogeriatry	18	26	44 (22)	16 (36.4)	5 (11.4)
Pneumology	18	6	24 (12)	13 (54.2)	10 (41.6)
Internal Medicine	15	6	21 (10.5)	12 (57.1)	6 (28.6)
Vascular	4	9	13 (6,5)	3 (23.1)	1 (7.7)
Cardiology	13	7	20 (10)	12 (60)	7 (35)
Neurology	9	31	40 (20)	28 (60)	19 (47.5)
Surgery	8	3	11 (5,5)	4 (36,4)	3 (27.3)
Total	100	100	200	102 (51)	57 (28.5)

Table 2
Diet texture adaptation and use of thickener.

DIETS (pre-diagnosis of dysphagia) PATIENTS	N	Normal (with thickener)	Soft diet (with thickener)	Pureé diet with liquids (with thickener)	Pureé diet without liquids (with thickener
De novo diagnosis of dysphagia.	30	10	10 (1)	4	6 (3)
Pts. with a probably dysphagia diagnosis[a]	27	5 (1)	2 (1)	2 (1)	18 (14)
Pts. Without dysphagia (totals)	143	83	42	15	3 (1)

[a] Patients who had already been identified with dysphagia before admission.

the confirmation of the underdiagnosis of dysphagia. We found than a quarter (23%) of the patients diagnosed who already had a history, suspected or confirmed dysphagia, were treated correctly or received the appropriate treatment (adaptation of diet and/or full fluids), but three quarters were left unattended which increased the risk of complications.

Our study shows that there was very significant infradiagnosis in our centre, since 53% of these patients are identified *de novo*. Moreover, those who did have a positive dysphagia history are only identified in 29.6% (27 of the total of 57). Apart from not having a properly established diagnosis, the appropriate treatment is not applied in 37% of these patients: They did not have the proper diet and/or the use of commercial food thickener for liquids. An appropriate diagnosis and the establishment of adequate treatment are crucial aspects in the treatment of dysphagia, however, there is still a high percentage of underdiagnosis in the clinical setting, as evidenced in our study and coincident with other authors that describe up to 60% [6]. This has important clinical implications because dysphagia is often accompanied by multiple comorbidities that can increase the risk of mortality [2,4]. They are usually weakened patients with specific needs for hydration and nutrition coincident with a greater risk of aspiration.

It is difficult to compare prevalence data in dysphagia because the definition criteria may vary or because it is always studied within certain pathologies. Detailed figures of each pathology can be found in the literature and have already been described in the introduction. In our case, we made a brief description of the situation and we confirmed the heterogeneity of the presence of the symptoms that can occur in any type of patient. Despite this we also confirmed that there are pathologies such as neurological that require more attention because it is where there is an increased risk of dysphagia. However, attention must also be paid to other pathologies such as cardiology, respiratory, or oncology where we have also found proportions not *negligible*. In this sense, identifying how dysphagia is distributed in our centre is very useful for assessing the importance of this symptom and improving care, especially considering all the complications described that may result from this situation.

It should be borne in mind that oropharyngeal dysphagia especially neurogenic dysphagia is a serious symptom, with complications that can cause the death of the patient, and that is not exclusive of any evolutionary moment. But we can find it both in the acute period of the process, as in the subacute or chronic, and also alone and as part of a syndromic group [33].

We propose that it is a diagnosable symptom, and there are treatments that avoid possible complications. The multidisciplinary approach is essential in diagnosis and treatment [22,33]. A team of professionals made up of doctors from different specialties, nurses, speech therapists, dieticians-nutritionists as well as caregivers and the family itself can help in the early detection of patients at risk of presenting dysphagia. The EAT-10, an easy screening tool that can be used by everyone [27,34] has identified 51% of the population studied as having dysphagia risk, and almost half of them have identified swallowing problems.

Our population is an aging population and we know that aging is related to the appearance of dysphagia. The concept of prebidysphagia appears in the literature as the alterations that occur in the mechanisms of swallowing with age [35,36]. This situation can be exacerbated in an acute process of the disease, confirmed by the finding of a high prevalence of 30% in ACH. In relation to another problem derived or cause from dysphagia, we bear out that a large percentage of these patients suffer from malnutrition or risk (73.5%). This is very much associated with an increase in health complications that result in greater use of hospital resources [5,37]. A dysphagia that receives poor treatment compromises the quality of life of the individual and increases morbidity, mortality and costs of care [38]. Sometimes its development can not be prevented, but it can be recognized early enough to be managed properly by a multidisciplinary team, and above all to avoid the mentioned complications and improve the quality of patient care and above all their safety.

6. Conclusions

All of the studied patients have been diagnosed in situ during their hospital stay and our results provide data on the prevalence of this symptom in the clinical environment. Confirming this proportion and the observed data ratifies the need to increase sensitivity to identify this symptom and improve its management.

There are a high proportion of patients with dysphagia without adequate treatment, so it is necessary to expand care strategies. There is little prevalence data in centres or local populations in our locality and knowing the reality of situation helps us to quantify the magnitude of the problem.

This study has allowed us to become aware of the prevalence of this symptom in order to adapt measures to address the screening process for its detection and management. It has also made us aware of the infradiagnosis and under treatment. This awareness of the issue on day to day basis, has led to the implementation of several therapeutic strategies in our centre: Creation of a multidisciplinary dysphagia committee, development of an internal guide, improvements in the identification of the patient during hospitalization (colour sign at the patient's bedside), as well as identifying with a coloured dot at the computer screen. Also, patients are coded with ICD-10 in the Medical documentation. Training presentations have also been offered in outpatient clinics and, above all, dysphagia awareness courses have been offered to all nursing staff.

Having a multidisciplinary team to manage it gives confidence to the professionals and allows a better approach to treatment.

Contribution of authors

Amaya Peñalva: collecting data and writing.

Rosa Prats: collecting data, especially in the sociosanitary setting (long term care hospital).

Maria Lecha & Anna Sansano: aid in collecting data.

Lluis Vila: general supervision, proofreading, statistics.

Conflict of interest/financial disclosures

None of the authors have any conflict of interest or financial disclosures.

This study has been made within hospital resources. No funding sources have been involved.

Acknowledgments

To all help received for my research. Special thanks to students Elena, Ana and Anabel, that have been helping in part of the study. Special mention to Montse Martin for statistical advice and also to Rory for writing assistance.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.clnesp.2019.07.003.

References

[1] Malagelada Juan. Bazzoli Franco (Italy), Boeckxstaens Guy (Belgium), De Looze Danny (Belgium), Fried Michael (Switzerland), Kahrilas Peter (USA) Lindberg Greger (Sweden)) Malfertheiner Peter (Germany), Salis Graciela (Argentina), Sharma Prateek (USA), Sifrim Daniel (UK), Vakil Nimish (USA) and LeMair Anton (Holland). Global guides and Waterfalls Updated in September. 2014. WGO Global Guides, www.worldgastroenterology.org/UserFiles/file/guidelines/dysphagia-english-2014.

[2] Altman KW, Yu GP, Schaefer SD. Consequence of dysphagia in the hospitalized patient: impact on prognosis and hospital resources. Arch Otolaryngol Head Neck Surg 2010 Aug;136(8):784–9.

[3] Rodrigues Padovanil A, Pedroni Moraes D, Chiarion Sassi F, Furquim de Andrade CR. Clinical swallowing assessment in intensive care unit. CoDAS 2013;25(1):1–7.

[4] Sarabia Aldana CA, Zavala-Solares MR. Oropharyngeal dysphagia in a patient with epidermolysis bullosa. Rev Gastroenterol Mex 2016 Oct–Dec;81(4):227–9.

[5] Cichero JA, Altman KW. Definition, prevalence and dimension of oropharyngeal dysphagia: a serious problem in older adults throughout world and the impact on hospital prognosis and resources. In: Cichero Julie, Clavé Pere, editors. The steps to live good with dysphagia Nestlé nutrition institute workshop series, 72; May 2011. p. 1–3. Barcelona.

[6] Kaspar Kala, Ekberg Olle. Identification of vulnerable patients: role of the EAT-10 and the multidisciplinary team for early intervention and comprehensive care of the dysphagia. In: Cichero Julie, Clavé Pere, editors. The steps to live good with dysphagia Nestlé nutrition institute workshop series, 72; May 2011. p. 5–8. Barcelona.

[7] Leader SB, Novella S, Patwa H. Use of fiberoptic endoscopic evaluation of swallowing (FEES) in patients with amyotrofic lateral sclerosis. Dysphagia 2004;19:177–81.

[8] Velasco MM, Arreola V, Clavé P, Puiggrós C. Oropharyngeal dysphagia: diagnosis and treatment. Nutr Clin Med 2007;I(3):174–202.

[9] Lopez Mongil R. From the symptom to the syndrome. In: Nutritional intervention in patients with dysphagia; 2014. p. 5–19. SEGG. Aging and Nutrition Notebooks sponsored by Vegenat.

[10] Ding X, Gao J, Xie C, Xiong B, Wu S, Cen Z, et al. Prevalence and clinical correlation of dysphagia in Parkinson disease: a study on Chinese patients. Eur J Clin Nutr 2018 Jan;72(1):82–6.

[11] Baena Gónzalez M, Molina Recio G. Approach dysphagia in Alzheimer's patients. Nutr Hosp 2016;33(3):739–48.

[12] Baena Marta González, Molina Guillermo. Approach to dysphagia in Alzheimer patients. Recio Grupo NURSE. School of Nursing of Córdoba. Córdoba, Spain. Nutr Hosp 2016;33(3):739–48.

[13] Barroso J. Oropharyngeal dysphagia and bronchoaspiration. Rev Esp Geriatr Gerontol 2009;44(S2):22–8.

[14] Martino R, Foley N, Bhogal S, Diamant N, Speechley M, Teasell R. Dysphagia after stroke: incidence, diagnosis, and pulmonary complications. Stroke 2005 Dec;36(12):2756–63.

[15] Marik PE, Kaplan D. Aspiration pneumonia and dysphagia in the elderly. Chest 2003;124:328–36.

[16] Ruiz de León A, Clavé P. Videofluoroscopy and neurogenic dysphagia. Rev Esp Enferm Dig 2007;99(1):3–6.

[17] Clavé P, Terré R, from Kraa M, Serra M. Approaching oropharyngeal dysphagia. Rev Esp Enferm Dig 2004 Feb;96(2):119–31.

[18] Roden DF, Altman KW. Causes of dysphagia among different age groups: a systematic review of the literature. Otolaryngol Clin N Am 2013 Dec;46(6):965–87.

[19] Hayashi M, Yahiro A, Sakuragi Y, Iwamatsu K, Sakamoto H, Kaizuka Y, et al. Impaired swallowing in hospitalized patients: an observational study in a community hospital in Japan (2012-2014). Nurs Res 2016 Sep-Oct;65(5):389–96.

[20] Holland G, Jayasekeran V, Pendleton N, Horan M, Jones M, Hamdy S. Prevalence and symptom profiling of oropharyngeal dysphagia in a community dwelling of an elderly population: a selfreporting questionnaire survey. Dis Esophagus 2011;24:476–80.

[21] Clavé Civit P, Garcia Peris P. Justification and objectives. In: Chapter 1, in Diagnosis guide and nutritional treatment and rehabilitated oropharyngeal dysphagia. Glosa, Barcelona; 2011. p. 13–9.

[22] Garcia peris P, Velasco C, Velasco M, Clave P. Dysphagia in the elderly. Nutr Hosp 2011;4(3):pp35–44.

[23] Ferrero Lopez MI, Castellano Vela E, Navarro Sanz R. Usefulness of implementing a dysphagia care program in a medium and long distance hospital. Nutr Hosp 2009;24(5):588–95.

[24] Ferrero Lopez MI, Garcia Gollarte JF, Botella Trelis JJ, Vidal OJ. Detection of dysphagia in institutionalized elderly. Rev Esp Geriatr Gerontol 2012;47(4):143–7.

[25] Ruiz García V, Valdivieso Martínez B, Soriano Melchor E, Rosales Almazán MD, Torrego Giménez A, Doménech Clark R, et al. Prevalence of dysphagia in the elderly admitted to a home hospital unit. Rev Esp Geriatr Gerontol 2007;42(1):55–8.

[26] Ramsay M, Savege T, Simpson BR, Goodwin R. Controlled sedation with alphaxolone-alphadolone. BMJ 1974;2(920):656–9.

[27] Burgos R. Translation and validation of the Spanish version of the EAT-10 scale for the screening of dysphagia. Nutr Hosp 2012 Nov-Dec;27(6):2048–54.

[28] Guigoz Y, Vellas B, Garry PJ. Assessing the nutritional status of the elderly: the Mini Nutritional Assesment as part of the geriatric evaluation. Nutrit Surv Elderly 1996;54:S59–65.

[29] Langmore SE, Terpenning MS, Schork A, Chen Y, Murray JT, Lopatin D, et al. Predictors of aspiration pneumonia: how important is dysphagia? Clin Interv Aging 2012;7:287–98.

[30] Cook IJ, Kahrillas PJ. AGA technical review on management of oropharyngeal dysphagia. Gastroenterology 1999;116:455–78.

[31] Bakhtiyari Jalal, Sarraf Payam, Nakhostin-Ansari Noureddin, Tafakhori Abbas, Jeri Logemann, Faghihzadeh Soghrat, et al. Effects of early intervention of swallowing therapy on recovery from dysphagia following stroke. J Neurol 2015;14(3):119–24.

[32] Dziewas Rainer, Beck Anne Marie, Clave Pere, Hamdy Haheen, Heppner Jürgen, Langmore Susan E, et al. Recognizing the importance of dysphagia: stumbling blocks and stepping stones in the twenty-first century. Dysphagia 2017;32(1):78–82.

[33] Rofes M, Key P. Oropharyngeal dysphagia is a prevalent risk factor for malnutrition in a cohort of older patients admitted with an acute disease to a general hospital. Clini Nutr (Edinburgh, Scotland) 2015;34:436–42.

[34] Belafsky PC, Mouadeb DA, Rees CJ, Pryor JC, Postma GN, Allen J, et al. Validity and reliability of the eating assessment tool (EAT-10). Ann Otol Rhinol Laryngol 2008 Dec;117(12):919–24.

[35] Jahnke V. Dysphagia in the elderly. HNO 1991 Nov;39(11):442–4. https://doi.org/10.1007/s00455-016-9746-2.

[36] Jungheim M, Schwemmle C, Miller S, Kühn D, Ptok M. Swallowing and dysphagia in the elderly. HNO 2014 Sep;62(9):644–51.

[37] Alvarez Hernandez Julia, Leon Sanz Miguel, Planas Vila Merce, Araujo Krysmaru, Garcia de Lorenzo Abelardo, Celaya Pérez Sebastian. On behalf of the PREDyCES® researcher Prevalence and costs of malnutrition in hospitalized dysphagic patients: a subanalysis of the PREDyCES® study. Nutr Hosp 2015;32(4):1830–6.

[38] Carrion S, Cabre M, Monteis R, Rock M, Palomera E, Serra-Prat M, et al. Oropharyngeal dysphagia is a prevalent risk factor for malnutrition in a cohort of older patients admitted with an acute disease to a general hospital. Clini Nutr (Edinburgh, Scotland) 2015;34:436–42.

[39] Ney DM, Weiss JM, Kind AJ, Robbins J. Senescent swallowing: impact, strategies, and interventions. Nutr Clin Pract 2009 Jun–Jul;24(3):395–413.