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ORIGINAL ARTICLE

Prevalence of oropharyngeal dysphagia in patients related with cerebrovascular disease at a neurorehabilitation unit[☆]



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KEYWORDS

Dysphagia;
Deglutition disorders;
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Abstract

Introduction: The oropharyngeal dysphagia is a frequently present side effect amongst cerebrovascular pathology, being quite relevant due to the possible respiratory and/or nutritional side effects.

Objective: To know the prevalence of oropharyngeal dysphagia in hospitalized-stroke patients within a neurorehabilitation unit.

Method: A cross-sectional study was designed whose target population was patients diagnosed of cerebrovascular pathology hospitalized in the neurorehabilitation unit within a mid/long term stay hospital in Madrid, Spain, from April 1st 2012 until January 31st 2015. Social-demographical and clinical variables have been chosen by checking the clinical records from the patients included.

Results: During the period time of the study 124 patients were admitted in the unit, amongst those 88 were male. A big part of the patients with oropharyngeal dysphagia were admitted with a diagnosis of focal-ischæmic stroke, 43.1% (n = 58), and 39.7% (n = 49) with intracerebral

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PALABRAS CLAVE

Disfagia;
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haemorrhagic stroke. It was also verified that 79.3% (n=46) of the patients diagnosed with dysphagia presented a total dependency, 17.3% (n=10) severe helplessness and 3.4% (n=2) moderate dependence in daily activities.

Conclusion: Dysphagia has a high prevalence within our unit and it is related to the degree of patient dependence related to life actions and, being recommended the use of the Volume-Viscosity Swallow Test when dealing with patients with stroke in order to identify early diagnosis.

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Prevalencia de disfagia orofaríngea en pacientes con patología cerebrovascular en una unidad de neurorrehabilitación

Resumen

Introducción: La disfagia orofaríngea es una secuela que está presente de forma muy frecuente en la patología cerebrovascular, y es importante dadas las complicaciones que puede presentar a nivel respiratorio y/o nutricional.

Objetivo: Conocer la prevalencia de disfagia orofaríngea en pacientes con ictus hospitalizados en una unidad de neurorrehabilitación.

Método: Estudio descriptivo transversal, teniendo como población accesible a los pacientes diagnosticados de patología cerebrovascular ingresados en la unidad de neurorrehabilitación de un hospital de media-larga estancia de Madrid en el periodo comprendido entre el 1 de abril de 2012 al 31 de enero de 2015. Se han recogido variables tanto sociodemográficas como clínicas a través de la consulta de historias clínicas de los pacientes incluidos en el estudio.

Resultados: En el periodo de estudio ingresaron 124 pacientes en la unidad, de los cuales 88 eran varones. Se presenta una prevalencia de disfagia orofaríngea del 46,8% (n=58). Gran parte de los pacientes con disfagia orofaríngea han ingresado con diagnóstico principal de accidente cerebrovascular de origen isquémico focal (43,1%; n=52) y un 39,7% (n=49) con diagnóstico de ictus hemorrágico intraparenquimatoso. Asimismo, verificamos que el 79,3% (n=46) de los pacientes diagnosticados de disfagia presentan un nivel de dependencia total, el 17,3% (n=10) dependencia severa y el 3,4% (n=2) dependencia moderada para las actividades básicas de la vida diaria.

Conclusión: La prevalencia de disfagia en nuestra unidad es alta, objetivando también una posible relación con el grado de dependencia para las actividades básicas de la vida diaria de los pacientes, siendo recomendable la realización del Método de Exploración Clínica Volumen-Viscosidad a los pacientes con ictus con el propósito de realizar un diagnóstico precoz de este trastorno.

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Introduction

Cerebrovascular disorders are brain changes secondary to a vascular event; their acute manifestation is termed *ictus* (Latin) (stroke). Stroke is defined as a sudden disruption of cerebral blood flow that temporarily or permanently alters the function of a particular area of the brain. After acute stroke treatment, patients can present different sequelae of sensory, cognitive, functional or swallowing dysfunction.^{1,2}

Dysphagia is a difficulty or inability to swallow food or drink. The most common form of dysphagia is oropharyngeal, triggered by neuromuscular changes causing weakness or lack of coordination. It presents in certain diseases of the central nervous system, such as stroke.³ The most severe complications of this syndrome are malnutrition and dehydration in the event of swallowing dysfunction, and

broncho-aspiration when swallowing safety is compromised. Aspiration of both solids and liquids through the trachea and the lungs is directly associated with respiratory infection.^{4,5} This is one of the most common complications and results in high hospital costs incurred through increased hospital stays, and increased material and human resources expenditure.³

It has been demonstrated that the prevalence of oropharyngeal dysphagia in hospital is high, encountered in around 40% of stroke patients in the acute phase, and a very similar percentage (38.6%) in patients in the subacute phase. The prevalence of dysphagia reduces to 6% in the chronic phase.^{3,6,7}

Dysphagia remains an underrated and under-diagnosed health problem that requires rehabilitation. It is advisable to include the Volume-Viscosity Clinical Examination Method (MEC.V-V) in nursing assessments as routine clinical

practice. This assessment enables a diet and care plan to be prepared tailored to the needs of each individual patient.^{8,9}

Hence the reason and need to undertake this study, to identify the significance of the problem and its prevalence, and in particular establish the prevalence of oropharyngeal dysphagia in stroke patients hospitalized in neurorehabilitation units. Our secondary objective was to establish the main clinical characteristics presented by these patients.

Method

A descriptive, cross-sectional, retrospective study was designed that analysed as its accessible population, all patients admitted from 1 April 2012 to 31 January 2015 in the neurorehabilitation unit of the *Fundación Instituto San José* in Madrid hospitalised within the Rehabilitable Brain Damage programme. The data was collected from the information in the patients' clinical histories. The following variables were gathered: sex, age, clinical diagnosis, diagnosis of dysphagia on discharge from the referral hospital, signs of impaired swallowing observed in the first 24 h (impaired safety, impaired efficacy reported in records, referred by the family and the presence of an enteral feed tube), a diagnosis made of dysphagia on admission to our centre (using the MEC.V-V), presence of feed tubes (nasogastric tube, gastrostomy tube and nasojejunal tube) and functional dependence on admission (Barthel's index).

In our unit, the MEC.V-V is protocolised as a tool for detecting oropharyngeal dysphagia and is duly recorded in our patients' clinical histories. It is undertaken during the first 24 h after admission, provided there are signs of impaired swallowing, and the presence of enteral feed tubes and/or impaired swallowing has been recorded in the patient's clinical history on discharge from the referral hospital. The test is applied with the patient sitting and on continuous O₂ saturation monitoring. Water boli are administered in volumes of 5, 10 and 20 ml with viscosities classified as nectar, liquid and pudding. On each occasion signs of compromised safety are recorded (cough, drop in O₂ saturation of between 3% and 5% and/or altered tone of voice) or signs of impaired efficacy (insufficient lip seal, oral or pharyngeal residue and fractional swallowing). In the event that any sign is detected compromising patient safety, the test is stopped. It is concluded that there is no dysphagia when no signs are observed of impaired safety or efficacy at any time during the test. This method is accessible in any environment because it is low cost, requires little specialisation, is sufficiently safe and can be applied to most patients with suspected dysphagia, and only requires a minimal level of collaboration. According to the authors who developed this test, it has a diagnostic sensitivity of above 85% and specificity of around 69%.¹⁰

Barthel's index is a generic measure that evaluates a patient's functional dependence in terms of activities of basic daily living (ABDL), by means of which different scores and weightings are allocated according to the subject's ability to undertake these activities: total

dependence (0–20); severe dependence (21–60); moderate dependence (61–90); mild dependence (91–99); independence (100).^{11,12}

Ethical aspects

This research study was presented to and approved by the relevant health area's accredited clinical research ethics committee (CREC of the *Hospital Clínico San Carlos*, Madrid). The voluntary nature of patient participation in this study was ensured through the written consent forms provided on admission under the hospital's protocol, by means of which patients authorise the use of their clinical data. The data of the subjects included in the study were treated confidentially.

Data analysis

The descriptive analysis is presented using mean and standard variation for the quantitative variables, and the qualitative variables are presented in absolute frequencies and percentages, using the IBM SPSS software package (IBM Corporation, New York, U.S.A.), version 19.0[®] for Windows. The graphic representations were created using Microsoft Excel 2007[®].

Results

One hundred and twenty-four patients were admitted during the period between 1 April 2012 and 31 January 2015. The sample comprised 29% (n = 36) females and 71% (n = 88) males, with a mean age of 56.45 (12.35) years. With regard to the clinical diagnosis of the patients based on the Cerebrovascular Disease Classification,¹³ it was observed that 41.9% (n = 52) of the sample had focal ischaemic stroke, 39.5% (n = 49) intraparenchymal haemorrhagic stroke, 13.7% (n = 17) subarachnoid haemorrhagic stroke and 4.8% (n = 6) global ischaemic stroke, in all cases there were more male than female cases.

In terms of level of dependence for BADL evaluated using Barthel's index, it was observed that 62.9% (n = 78) of the patients were admitted with a total level of dependence, 26.6% (n = 33) had severe dependence, 8.9% (n = 11) moderate dependence and 1.6% (n = 2) were independent.

A prevalence of oropharyngeal dysphagia was observed in 46.8% (n = 58). The data showed that 25 of the cases of dysphagia detected in our unit were not diagnosed in the referral hospital, a rate of under-diagnosis of around 43.1% was observed in this population.

Of the total number of patients admitted (n = 124), 21.2% (n = 30) had an enteral feed system of some type. Of these 30 subjects, 14 (46.6%) had a nasogastric tube placed on admission, 13 (43.3%) had a percutaneous gastrostomy tube and 3 (10.1%) a nasojejunal tube. These percentages reduced on discharge to 2 subjects (6.6%) with a nasogastric tube and one (3.3%) with a nasojejunal tube. The number of patients discharged with a gastrostomy tube increased from 13 to 14 (46.6%). Therefore, 43.5% (n = 13) of the patients admitted with an enteral feed system were able to have this

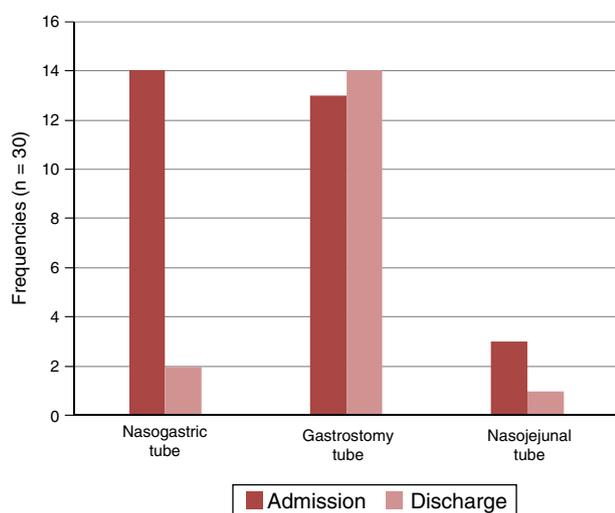


Figure 1 Presence of enteral feeding tubes in the patients included in the study.

removed during their stay in the neurorehabilitation unit (Fig. 1).

In our unit, the presence of oropharyngeal dysphagia was detected using the MEC.V-V, performed on 49.2% ($n=61$) of the patients within the first 24 h after admission with suspected impaired swallowing. It was checked that the observed signs of this impairment were: the presence of enteral feed tubes (24.2%; $n=30$); reference in the report to liquids taken with thickeners or jellified water (12.1%; $n=15$); signs of impaired safety (6.5%; $n=8$); reported by the family/caregiver (5.6%; $n=7$), and impaired efficacy (0.8%; $n=1$) (Fig. 2).

The Barthel index results in the referred population showed that 79.3% ($n=46$) of the patients diagnosed with oropharyngeal dysphagia presented a level of total dependence; 17.3% ($n=10$), severe dependence and 3.4% ($n=2$), moderate dependence.

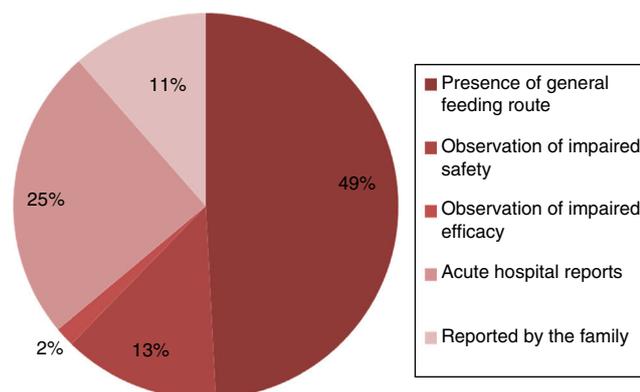


Figure 2 Signs of possible impaired swallowing observed within the first 24 h after admission of patients to the hospital unit. The data are expressed as percentages.

Discussion

This study was designed to determine the prevalence of oropharyngeal dysphagia in stroke patients hospitalised in a neurorehabilitation unit and to establish the clinical features of these patients.

Stroke is a major public health problem and is considered the primary cause of permanent disability in adults. Many patients that survive have major sequelae that restrict their daily activities.¹ Epidemiological studies, such as those performed by Marrugat et al.,¹⁴ have described that both haemorrhagic cerebrovascular disease and ischaemic disease present a greater incidence in males and in the age range from 55 to 64 years. The results of our study are in line with the aforementioned results, since the total sample of 124 stroke patients comprised 88 males with a mean age of 57.1 years.

Patients with cerebrovascular disease, especially hemispheric and brainstem stroke can suffer oropharyngeal dysphagia.¹⁵ In recent years an increased number has been observed of patients diagnosed with oropharyngeal dysphagia in both acute admission hospitals and mid and long stay units. In our neurorehabilitation unit we observed a high prevalence of oropharyngeal dysphagia (46.8%). These results are similar to those presented in neurological disorder rehabilitation units (38.6%) in 2012.⁶ Another study places the prevalence of dysphagia after cerebrovascular accident at between 40% and 80%.¹⁶ A high prevalence of oropharyngeal dysphagia has also been observed in people of advanced age that have suffered a cerebrovascular event, at around 30–40% in people aged over 65 years, this is greater in institutionalised elderly patients, where the figure rises to 60%.^{17,18}

Between 42% and 67% of patients with acute cerebrovascular disease manifest oropharyngeal dysphagia within the first 3 days of presentation.¹⁹ Methods for diagnosing this syndrome, such as video fluoroscopy, show the presence of dysphagia in 64–90% of stroke patients in the acute phase and silent aspiration in 22–42%.¹⁵ The risk of pneumonia is 7 times greater in patients with cerebrovascular disease who aspirate, compared to those who do not.²⁰ This oropharyngeal dysphagia is a highly prevalent sequela in patients after a cerebrovascular accident, not only in the acute phase, but also in subacute phases, and has major clinical impact, including respiratory repercussions.⁴ Deglutitive aspiration comprises 85% of aspirations in neurological patients and occurs during the pharyngeal phase of swallowing due to slow closure of the airway and opening of the upper oesophageal sphincter. Postdeglutitive aspiration comprises 10% of aspirations in neurological and elderly patients due to reduced tongue propulsion strength, which creates more residue in the hypopharynx, with the consequent risk of aspiration on the next inhalation.¹⁵

With regard to prompt or early diagnosis of this sequela, we can observe from these results that it is under-diagnosed, since it is not diagnosed in most of the patients from the acute admissions hospital.⁶ Therefore we suggest that applying a method as simple and useful as the MEC.V-V in all care areas would reduce the number of under-rated or under-diagnosed cases.^{10,21} In addition, it has been

observed that the MEC.V-V enables the texture of solids and viscosity of liquids to be adapted with great therapeutic efficacy, as shown by Clavé and collaborators in their study. They observed that the prevalence of liquid bolus aspirations was greater than 20% in neurological and elderly patients and reduced to 10% with nectar viscosity and to 5.3% with pudding viscosity. Finally, modifying the texture of liquids adapted to each patient with oropharyngeal dysphagia ensures hydration without aspiration, and the reduction of bolus volume and increased viscosity reduce aspiration, especially with nectar and pudding viscosities.^{15,17,22}

The data obtained from our study show that oropharyngeal dysphagia most often presents in patients with total (79.3%) and/or severe (17.3%) dependence. These results coincide with those of several authors, which suggests that the functional recovery of the patient might be associated with dysphagia. Silveira et al.²³ state in their study that there is a greater presence of dysphagia in highly dependent or immobile patients, therefore these two variables could be set as markers of the risk of dysphagia. Similarly, Roy et al.²⁴ associate dysphagia with a worse situation and poorer outcomes in functional recovery.

Conclusion

With this study, we can conclude that there is a very high prevalence of oropharyngeal dysphagia which highlights the importance of early diagnosis of this disorder and the usefulness of screening methods such as the MEC.V-V in preventing associated complications. This method is a useful tool because it can prevent invasive measures (placement of nasogastric tube, gastrostomy tube) to feed and hydrate patients safely and efficiently, allowing us to meet the needs of the patient. It is important to bear in mind the need for early diagnosis of stroke patients with a total level of dependency, this being a possible predictor of oropharyngeal dysphagia, and adapt the necessary measures to avoid or at least minimise further complications.

Conflict of interests

The authors have no conflict of interests to declare.

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