

Chronic obstructive pulmonary disease: swallowing analysis in hospitalized patients

Doença pulmonar obstrutiva crônica: análise da deglutição em pacientes hospitalizados

Enfermedad pulmonar obstructiva crónica: análisis de la deglución en pacientes hospitalizados

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Abstract

Objective: To investigate the occurrence of dysphagia and the risk of bronchoaspiration in hospitalized patients with chronic obstructive pulmonary disease and to verify if there is any association between the severity of dysphagia and the risk of aspiration with sociodemographic aspects, clinical characteristics, stomatognathic system and swallowing dynamics. **Methods:** descriptive observational study using the retrospective type of electronic data collection. We evaluated 27 medical records of patients with chronic obstructive pulmonary disease admitted to a public hospital in Minas Gerais in the period from July 2012 to July 2015 and with swallowing assessment. To verify the presence of dysphagia and the risk of bronchoaspiration the protocol The Mann Assessment of Swallowing Ability was used. Statistically significant associations were those whose p-value was ≤ 0.05 and 95% confidence interval. **Results:** Between the 27 patients evaluated by the speech-language pathology team, 41.7% had dysphagia, with light severity being the majority (82%) and 19% had a risk of bronchoaspiration. There was no predominance of any phase of altered swallowing. There was an association between the presence of dysphagia and

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Authors' contributions:

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Received: 22/03/2017

Accepted: 27/02/2018

patient cooperation, and the risk of aspiration with oral transit time. **Conclusion:** The results showed a relationship between dysphagia and aspiration risk in hospitalized patients with chronic obstructive pulmonary disease, suggesting the need to investigate the dynamics of swallowing during hospitalization.

Keywords: Deglutition disorders; Chronic obstructive pulmonary disease; Dysphagia.

Resumo

Objetivos: investigar a ocorrência de disfagia e o risco de broncoaspiração em pacientes hospitalizados com doença pulmonar obstrutiva crônica, e verificar se há associação com as características sociodemográficas, clínicas, do sistema estomatognático e da dinâmica de deglutição. **Métodos:** estudo descritivo observacional e retrospectivo com coleta de dados no prontuário eletrônico. Foram avaliados 27 prontuários de pacientes com doença pulmonar obstrutiva crônica, internados em um hospital público de Minas Gerais no período de julho de 2012 a julho de 2015 e com avaliação de deglutição. Para verificar a presença de disfagia e o risco de broncoaspiração foi utilizado o protocolo *The Mann Assessment of Swallowing Ability*. Foram consideradas associações estatisticamente significativas aquelas cujo p-valor foi $\leq 0,05$ e intervalo de confiança de 95%. **Resultados:** Dos 27 pacientes avaliados pela equipe de fonoaudiologia, 41,7% tinham disfagia, sendo a gravidade leve mais prevalente (82%) e 19% tinham risco de broncoaspiração. Não houve predomínio de alguma fase da deglutição alterada. Houve associação entre presença de disfagia e a cooperação do paciente, e o risco de aspiração com o tempo de trânsito oral. **Conclusão:** Os resultados mostraram relação entre disfagia e risco de aspiração em pacientes internados com doença pulmonar obstrutiva crônica, sugerindo a necessidade de investigação da dinâmica da deglutição durante a hospitalização.

Palavras-chave: Transtornos de deglutição; Doença Pulmonar Obstrutiva Crônica; Disfagia.

Resumen

Objetivos: investigar la ocurrencia de disfagia y el riesgo de broncoaspiración en pacientes hospitalizados con enfermedad pulmonar obstructiva crónica y verificar si hay asociación con las características sociodemográficas, clínicas, del sistema estomatognático y la dinámica de la deglución. **Métodos:** Estudio observacional descriptivo de tipo retrospectivo con recogida de datos en registros médicos electrónicos. Se evaluaron 27 registros médicos de pacientes con enfermedad pulmonar obstructiva crónica, internados en un hospital público de Minas Gerais en el período de julio de 2012 a julio de 2015 y con evaluación de deglución. Para verificar la presencia de disfagia y el riesgo de broncoaspiración se utilizó el protocolo *The Mann Assessment of Swallowing Ability*. Se consideraron asociaciones estadísticamente significativas aquellas cuyo valor de p fue $\leq 0,05$ e intervalo de confianza de 95%. **Resultados:** De los 27 pacientes evaluados por el equipo de fonoaudiología, el 41,7% tenían disfagia, siendo la gravedad leve más prevalente (82%) y el 19% tenían riesgo de broncoaspiración. No hubo predominio de cualquier fase de la deglución alterada. Hubo asociación entre la presencia de disfagia y la cooperación del paciente, y el riesgo de aspiración con el tiempo de tránsito oral. **Conclusión:** Los resultados mostraron relación entre disfagia y riesgo de aspiración en los pacientes hospitalizados con enfermedad pulmonar obstructiva crónica, lo que sugiere una necesidad de investigación sobre la dinámica de la deglución durante una hospitalización.

Palabras claves: Trastornos de la deglución; Disfagia; Enfermedad pulmonar obstructiva crónica.

Introduction

Chronic obstructive pulmonary disease (COPD) is characterized by airflow limitation, which leads to pathological changes in the lungs. Airflow limitation is associated with abnormal inflammatory responses of the lungs to noxious particles or gases¹.

Some of the symptoms presented in COPD are: wheezing, productive cough and dyspnea on respiratory effort. Dyspnea on respiratory effort is the symptom associated with worse prognosis, with lower capacity and greater loss of lung function². In addition to smoking, the genetic predisposition, socioeconomic factors, exposure to pollution and heavy particles in the air are related to the onset of COPD³.

Studies show that COPD is the fourth leading cause of death in the United States and Europe, and the impact of the disease tends to increase due to population aging⁴. In Brazil, it is the third leading cause of death, showing a 12% increase between 2005 and 2010, which means that there are approximately 40,000 deaths per year caused by COPD⁵. It is estimated that five to six million Brazilians have COPD, with patients tending to be concentrated mainly in the age brackets above 50 years⁶.

The diagnosis of COPD should be considered in any individual presenting characteristic symptoms and history of exposure to risk factors for the disease, especially cigarette smoke⁷.

Changes in respiratory pattern may influence the coordination between swallowing and breathing of individuals with COPD⁸. The patients affected by the disease are more susceptible to the alterations of this synchronism, which increases the risks of respiratory infections and bronchoaspirations⁹.

The reduction in laryngopharyngeal sensitivity may compromise the triggering of swallowing¹⁰, being a risk factor for exacerbation of the disease^{9,10}. Although dysphagia is part of the symptoms presented by patients with COPD, little emphasis is given to the early identification of swallowing changes¹¹.

Speech and language rehabilitation in oropharyngeal dysphagia aims to protect the lower airways and the patient's nutrition¹². The role of the speech-language pathologist in the multidisciplinary team contributes to the reduction of length of hospital stay and hospital readmission due to complications related to alterations in oral motor functions¹³. The

effectiveness of speech therapy is defined by the resumption of oral feeding with nutritional value and safety in swallowing¹⁴.

Dysphagia is an alteration that can compromise the clinical conditions and quality of life of the patient and its complications such as malnutrition, dehydration and aspiration pneumonia (PNM) can aggravate recovery. Thus, in individuals with COPD, respiratory conditions may interfere in the swallowing dynamics and be more predisposed to the complications of dysphagia.

Thus, this study aims to investigate the occurrence of dysphagia and the risk of bronchoaspiration in hospitalized patients with COPD, and to verify if there is an association with the sociodemographic, clinical, stomatognathic system and swallowing dynamics characteristics.

Methods

This is a descriptive analytic retrospective study, of non-probability sampling, from data collection of the electronic medical record of patients admitted to a public hospital in Belo Horizonte, MG. Paper approved by the Ethics Committee of the Federal University of Minas Gerais - CAAE 53353616.8.0000.5149 and by the Teaching and Research Center of the Risoleta Tolentino Neves Hospital - No. 42/2015.

The inclusion criteria adopted in this study were hospitalized patients from July 2012 to July 2015, aged over 18 years, with chronic obstructive pulmonary disease, evaluated by the Speech-language pathology team of the hospital. The medical records of patients with associated neurological, psychiatric, mechanically ventilated or tracheostomy patients, esophageal dysphagia, surgeries or lung and head and neck neoplasms, and patients who died before the speech-language evaluation were excluded.

In order to identify the possible participants, the computer sector of the hospital surveyed patients with a medical diagnosis of COPD through the International Classification of Diseases (ICD) in the computerized registration system during the stipulated period. Regarding the survey, 40 patients were identified and the electronic medical records were consulted to verify which patients fit the inclusion criteria and had been submitted to speech-language evaluation. After this, 29 patients were candidates; however two of them were excluded

due to incomplete data from the speech-language evaluation.

The diagnosis of COPD in the hospital where the study was performed is done by a physician, general practitioner or pulmonologist who is accompanying the patient, through the history and clinical examination, spirometry and chest X-ray.

In order to verify the presence of dysphagia and the risk of bronchoaspiration, the protocol *The Mann Assessment of Swallowing Ability (MASA)*¹⁵ was used, which includes the motor and sensorial evaluation of the structures involved in the swallowing process and clinically investigates the swallowing dynamics. Although the instrument was validated for the population with stroke, it was chosen to use this instrument because there is no other validated for patients with COPD and it provides information regarding the objectives of this study.

The following items were withdrawn from the MASA protocol due to lack of data in the medical records: aphasia, respiration (pulmonary auscultation), voluntary cough and dyspraxia. The item dysarthria was adapted for speech, due to the exclusion of neurological patients. After exclusion of these items, the adequacy of the dysphagia severity scale score and the risk of bronchoaspiration were performed. Thus, the scores between 151 and 170 points indicate absence of dysphagia; between 142 and 150 points - mild dysphagia; between 117 and 141 points - moderate dysphagia and values below 117 points - severe dysphagia. Regarding the risk of aspiration, scores between 145 and 170 points indicate absence of risk; between 127 and 144 points - mild risk; less than or equal to 126 points - moderate risk and values below 118 points - severe risk.

The data collected were: gender, age, presence of comorbidities (pneumonia, heart disease, fall / fracture, metabolic), feeding route before speech-language assessment, ventilatory support, alertness, cooperation, comprehension, speech, voice, dentition, oral hygiene, lip closure, tongue movement, tongue strength, tongue coordination, GAG reflex, soft palate mobility, cough reflex, saliva swallowing, oral preparation, bolus clearance, oral transit, pharyngeal phase, pharyngeal response, respiratory rate, functional level of swallowing by means of *Functional Oral Intake Scale (FOIS)*¹⁶ after evaluation of Speech-language pathology, severity of dysphagia, and risk of aspiration. The FOIS scale is characterized by seven levels: Level 1: Nothing

by mouth; Level 2: Tube dependent with minimal attempts of food or liquid; Level 3: Tube dependent with consistent oral intake of food or liquid; Level 4: Total oral diet of a single consistency; Level 5: Total oral diet with multiple consistencies, but requiring special preparation or compensations; Level 6: Total oral diet with multiple consistencies without special preparation, but with specific food limitations; Level 7: Total oral diet with no restrictions¹⁶.

After data collection, descriptive analyzes of the variables were performed by means of absolute and relative frequency distribution of categorical variables and numerical synthesis of continuous variables. Regarding bivariate association analyzes, three variables were considered: 1. presence and absence of dysphagia; 2. risk of aspiration (present and absent) and 3. severity of dysphagia (mild and moderate). The explanatory variables were grouped into two blocks: the first one related to the characterization of the patients (gender, age, comorbidities, feeding path before speech-language evaluation, ventilatory support, alertness, cooperation, understanding, speech, voice), and the second related to the characteristics of the stomatognathic system and swallowing (dentition, oral hygiene, lip closure, tongue movement, tongue strength, tongue coordination, cough reflex, saliva swallowing, oral preparation, bolus clearance, oral transit, pharyngeal phase, pharyngeal response, respiratory rate). The association analysis was chosen to be performed between all the explanatory variables and the three response variables, increasing the possibilities of the requested analyzes.

The explanatory variables were also recoded to reduce the categories with little information and to improve the estimates of the analyzes. The remaining variables were maintained in the original form for the bivariate analysis.

Regarding the categorical variables, Pearson's chi-square test or Fisher's Exact test was used to analyze the associations. When evaluating the association between the response variables and the age variable (normal distribution), the T-test was used. The statistically significant associations considered were those whose p-value was ≤ 0.05 and 95% of confidence interval. *Statistical Package for the Social Sciences (SPSS)*, version 21.0 was used for all the analysis.

Results

The majority of patients were female (59.3%), ranging in age from 55 to 97 years old, mean age of 74.9 years (SD = 10.7). Among the comorbidities, there was a greater occurrence of pneumonia and metabolic diseases (25.9% each), followed by renal disease (22.2%), heart disease (18.5%), digestive diseases and trauma fall (3.7% each). The fluctuation of the level of consciousness was 51.9% of the patients, 63.0% were cooperative and 92.0% used respiratory support through non-invasive ventilation (nasal catheter or face mask).

Speech-language assessment revealed that 70.4% had adequate hearing comprehension, 77.8% without speech abnormality and 51.9% had voice alterations. Regarding oral conditions,

63.0% were edentulous and 66.7% had adequate oral hygiene. No abnormalities were detected in relation to GAG (100.0%) and soft palate (100.0%); regarding the movement, strength and coordination of the tongue, these were adequate in 88.9%, 85.2% and 77.8% of the patients, respectively. The cough reflex was adequate in 96.3% of patients and saliva swallowing without abnormalities in 85.2%.

Regarding swallowing, through the MASA instrument, 41.7% of the patients had dysphagia, with lightness being more prevalent, and 19% had a risk of bronchoaspiration. There was no predominance of any altered swallowing phase, since the incoordination in the respiratory rate during the evaluation of the swallowing dynamics was frequent among the patients evaluated, according to the data presented in Table 1.

Table 1. Characterization of deglutition in hospitalized patients with COPD

Characteristics		N (n=27)	%
Dysphagia	Absent	16	59.3
	Present	11	41.7
Severity (N=11)	Mild	9	82,0
	Moderate	2	18,0
Risk of aspiration	Absent	22	81,0
	Present	5	19,0
FOIS after speech-language assessment	1	12	44.5
	5	10	37,0
	6	3	11.1
	7	2	7.4
Oral preparation	Adequate	25	92.6
	Altered	2	7.4
Clearance of bolus	Adequate	24	88.9
	Altered	3	11.1
Oral transit	Adequate	25	92.6
	Altered	2	7.4
Pharyngeal phase	Adequate	21	78,0
	Altered	6	22,0
Pharyngeal response	Adequate	24	89,0
	Altered	3	11,0
Respiratory rate	Adequate	4	14.8
	Altered	23	85.2

Legend: N = number of patients, FOIS = Functional Oral Intake Scale

The analysis of the association between the presence of dysphagia and sociodemographic and clinical characteristics of the patients revealed that the only variable that was associated with the pres-

ence of dysphagia was the patient's cooperation, with a higher proportion of uncooperative patients among those who had dysphagia compared to patients without dysphagia (Table 2).

Table 2. Association between dysphagia and characteristics of patients with COPD (N = 27)

Characteristics	Dysphagia				Value-p*
	Absent		Present		
	N	%	N	%	
Gender					
Male	7	41.2	4	40.0	0.637
Female	10	58.8	6	60.0	
Total	17	100.0	10	100.0	
Comorbidities					
Pneumonia	5	29.4	2	20.0	0.488
Heart diseases	4	23.5	1	10.0	
Others	8	47.1	7	70.0	
Total	17	100.0	10	100.0	
Ventilatory support					
AA (ambient air)	1	5.9	1	10.0	0.613
Ventilatory support	16	94.1	9	90.0	
Total	17	100.0	10	100.0	
Alertness					
Adequate	10	58.8	3	30.0	0.147
Inadequate	7	41.2	7	70.0	
Total	17	100.0	10	100.0	
Cooperation					
Adequate	14	82.4	3	30.0	0.010
Inadequate	3	17.6	7	70.0	
Total	17	100.0	10	100.0	
Age					
Median		77.0		73.5	0.393
Mean		76.2		72.5	
Standard Deviation		10.7		10.9	

*Pearson's chi-square or Fisher's Exact

None of the variables of the stomatognathic system and swallowing were associated with the presence of dysphagia (Table 3).

There was no association between the risk of aspiration and the sociodemographic and clinical characteristics of patients with COPD (Table 4).

Table 3. Association between dysphagia and variables of the stomatognathic system and deglutition (N = 27)

Characteristics	Dysphagia				Value-p*
	Absent		Present		
	N	%	N	%	
Oral Hygiene					
Adequate	12	70.6	6	60.0	0.439
Inadequate	5	29.4	4	40.0	
Total	17	100.0	10	100.0	
Lip Closure					
Adequate	16	94.1	8	80.0	0.128
Inadequate	1	5.9	2	20.0	
Total	17	100.0	10	100.0	
Tongue Movement					
Adequate	16	94.1	1	10.0	0.303
Altered	1	5.9	9	90.0	
Total	17	100.0	10	100.0	
Tongue Strength					
Adequate	15	88.2	8	80.0	0.477
Altered	2	11.8	2	20.0	
Total	17	100.0	10	100.0	
Tongue Coordination					
Adequate	15	88.2	6	60.0	0.112
Altered	2	11.8	4	40.0	
Total	17	100.0	10	100.0	
Cough Reflex					
Adequate	16	94.1	10	100.0	0.630
Altered	1	5.9	0	0.0	
Total	17	100.0	10	100.0	
Saliva Swallowing					
Adequate	16	94.1	7	70.0	0.128
Altered	1	5.9	3	30.0	
Total	17	100.0	10	100.0	
Oral Preparation					
Adequate	16	94.1	9	90.0	0.613
Altered	1	5.9	1	10.0	
Total	17	100.0	10	100.0	
Bolus Clearance					
Adequate	16	94.1	8	80.0	0.303
Altered	1	5.9	2	20.0	
Total	17	100.0	10	100.0	
Oral Transit					
Adequate	17	100.0	8	80.0	0.128
Altered	0	0.0	2	20.0	
Total	17	100.0	10	100.0	
Pharyngeal Response					
Adequate	15	88.2	7	70.0	0.249
Altered	2	11.8	3	30.0	
Total	17	100.0	10	100.0	
Pharyngeal Response					
Adequate	17	100.0	8	80.0	0.128
Altered	0	0.0	2	20.0	
Total	17	100.0	10	100.0	
Respiratory Rate					
Adequate	2	11.8	2	20.0	0.477
Altered	15	88.2	8	80.0	
Total	17	100.0	10	100.0	

* Fisher's Exact test

Table 4. Association between risk of aspiration and characteristics of patients with COPD (N = 27)

Characteristics	Aspiration				Value-p*
	Absent		Present		
	N	%	N	%	
Gender					
Male	10	43.5	1	25.0	0.455
Female	13	56.5	3	75.0	
Total	23	100.0	4	100.0	
Comorbidities	N	%	N	%	
PNM	5	21.7	2	50.0	0.378
Heart diseases	5	21.7	0	0.0	
Others	13	56.5	2	50.0	
Total	23	100.0	4	100.0	
Ventilatory support	N	%	N	%	
AA (ambient air)	1	4.3	1	25.0	0.279
Ventilatory support	22	95.7	3	75.0	
Total	23	100.0	4	100.0	
Alertness	N	%	N	%	
Adequate	12	52.2	1	25.0	0.327
Inadequate	11	47.8	3	75.0	
Total	23	100.0	4	100.0	
Cooperation	N	%	N	%	
Adequate	15	65.2	2	50.0	0.477
Inadequate	8	34.8	2	50.0	
Total	23	100.0	4	100.0	
Age					
Median		77.0		70.5	0.448
Mean		75.5		71.0	
Standard Deviation		10.0		15.8	

* Pearson's chi-square or Fisher's Exact

The only variable that was associated with the risk of aspiration was oral transit, and all patients without dysphagia had adequate oral transit. Among the patients with dysphagia, half had altered oral transit (Table 5).

Regarding the associations between the severity of dysphagia (mild and moderate) and sociodemographic, clinical, stomatognathic and swallowing characteristics of patients with COPD, none were associated with the risk of aspiration.

Table 5. Association between aspiration risk and stomatognathic system and swallowing variables (N = 27)

Characteristics	Aspiration				Value-p*
	Absent		Present		
	N	%	N	%	
Oral Hygiene					
Adequate	15	65.2	3	75.0	0.593
Inadequate	8	34.8	1	25.0	
Total	23	100.0	4	100.0	
Lip Closure					
Adequate	21	91.3	3	75.0	0.395
Inadequate	2	8.7	1	25.0	
Total	23	100.0	4	100.0	
Tongue Movement					
Adequate	21	91.3	3	75.0	0.092
Altered	2	8.7	1	25.0	
Total	23	100.0	4	100.0	
Tongue Strength					
Adequate	21	91.3	2	50.0	0.092
Altered	2	8.7	2	50.0	
Total	23	100.0	4	100.0	
Tongue Coordination					
Adequate	19	82.6	2	50.0	0.204
Altered	4	17.4	2	50.0	
Total	23	100.0	4	100.0	
Cough Reflex					
Adequate	22	95.7	4	100.0	0.852
Altered	1	4.3	0	0.0	
Total	23	100.0	4	100.0	
Saliva Swallowing					
Adequate	20	87.0	3	75.0	0.495
Altered	3	13.0	1	25.0	
Total	23	100.0	4	100.0	
Oral Preparation					
Adequate	22	95.7	3	75.0	0.279
Altered	1	4.3	1	25.0	
Total	17	100.0	10	100.0	
Bolus Clearance					
Adequate	21	91.3	3	75.0	0.395
Altered	2	8.7	1	25.0	
Total	23	100.0	4	100.0	
Oral Transit					
Adequate	23	100.0	2	50.0	0.017
Altered	0	0.0	2	50.0	
Total	23	100.0	4	100.0	
Pharyngeal Phase					
Adequate	20	87.0	2	50.0	0.144
Altered	3	13.0	2	50.0	
Total	23	100.0	4	100.0	
Pharyngeal Response					
Adequate	23	100.0	2	50.0	0.128
Altered	0	0.0	2	50.0	
Total	23	100.0	4	100.0	
Respiratory Rate					
Adequate	3	13.0	1	25.0	0.495
Altered	20	87.0	3	75.0	
Total	23	100.0	4	100.0	

* Fisher's Exact test

Discussion

The data from this study showed that patients with COPD had dysphagia and aspiration risks. In one study, the authors suggested that although patients with COPD do not present complaints regarding swallowing, they present significant risks for aspiration, since they have alterations in breathing pattern, which may alter the coordination between breathing and swallowing, which is fundamental for the protection of the inferior airway¹⁷. The inspiratory pattern with the opening of the vocal folds can facilitate the entry of food and saliva into the larynx during or after swallowing, increasing the risk of aspiration¹⁸.

In the Functional Oral Intake Scale (FOIS), 44.5% of the patients presented FOIS 1 after the speech-language pathology evaluation. Although the severity of dysphagia was considered mild in most participants, the exclusive alternative route of feeding was established shortly after evaluation due to the respiratory conditions of these patients hospitalized for complications of COPD. This indicates more speech-language caution on the alimentary tract. It is worth mentioning that laryngeal aspiration may be a possible cause of COPD exacerbations¹⁹.

One of the non-dysphagic patients was classified as FOIS 1 (nothing oral), because he presented compromised alertness (fluctuation of consciousness level and cooperation - distraction by other stimuli), with the other MASA items being adequate. As the MASA is a protocol of scores, this patient did not reach enough points to be classified as dysphagic.

During the oral phase, food preparation takes place in the oral cavity by chewing and processing into a cohesive food bolus²⁰. Difficulties in this phase interfere with the quality and safety of food, and the cooperation of the patient is of fundamental importance²¹. In this study, the patient's cooperation was associated with dysphagia, which corroborates with the literature.

The pharyngeal phase and the pharyngeal response were the alterations found in the population studied, followed by compromised oral transit, in which it was associated with the risk of aspiration. Patients with COPD have symptoms of dysphagia related to the pharyngeal phase of deglutition, regarding the mechanism of protection of the airways⁸. Other studies verified prolonged oral

transit time²², reduced laryngeal elevation during swallowing and alteration of the cricopharyngeal muscle^{9,23}. Poor oral motor control can impair ejection of the food bolus and thus aspiration occurs before swallowing; therefore, it is essential to thoroughly evaluate all phases of swallowing in patients with COPD.

Although age could have been a factor contributing to the chance of dysphagia or risk of aspiration, no association was observed in the study population, since the mean age was 74 years. There is a reduction in chest cavity mobility, pulmonary elasticity and a decrease in maximum inspiratory and expiratory pressure values through aging, from an anatomical and functional point of view²⁴. In addition to respiratory impairment, the elderly population, due to aging in the swallowing mechanism, presents a greater risk for dysphagia, due to reduced orofacial sensitivity, decreased oral movements, dental losses and the use of prostheses²⁵.

Regarding comorbidities, in this study, there was a higher occurrence of pneumonia and metabolic diseases. Patients with COPD have frequent infections of the lower respiratory tract¹⁹ due to swallowing disorders²³. One study verified the presence of laryngeal penetration and aspiration through videofluoroscopy in patients with COPD²⁶. Two studies evaluated the coordination between swallowing and breathing through plethysmography and verified a greater time of apnea and swallowing occurrence in the inspiratory phase of breathing, which favors the aspiration^{27,28}.

Although the results indicate associations between dysphagia and COPD, the reduced sample size did not allow robust statistical analysis. In addition, it was not possible to verify the correlation between swallowing disorder and the degree of COPD impairment, since the hospital where the collection was performed is not a reference in respiratory comorbidities; therefore, staging of COPD through the *GOLD* scale was infrequent among the participants, making the analysis unfeasible.

However, the results showed dysphagia and aspiration risk in hospitalized patients with COPD, suggesting the need to investigate the swallowing dynamics during hospitalization, including objective exams such as videofluoroscopy or videoendoscopy of swallowing. All staff involved in the treatment of these patients should be aware of the possibility of dysphagia, which may increase the risk of complications during hospitalization.

The prevention of bronchoaspiration is one of the objectives recommended in the hospitalized patient's safety.

Conclusion

Dysphagia was present in 41.7% of patients with COPD who were evaluated by the speech-language pathology team, with lightness being more prevalent, and the risk of aspiration was 19%. Uncooperative patients with increased oral transit time were the variables associated with the presence of dysphagia and the risk of aspiration, respectively.

The results of this study suggest that the investigation of swallowing ability should be performed routinely in all patients with hospitalized COPD in order to minimize clinical complications related to dysphagia.

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