Nutritional profile of cardiac patients with dysphagia: a descriptive pilot study

Perfil nutricional do paciente cardiopata com disfagia: um estudo descritivo piloto

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ABSTRACT

Introduction: Cardiovascular diseases (CVD) are the main causes of death in Brazil, which can be treated with clinical and/or surgical methods. Dysphagia is a very common condition in hospitalized patients, especially among those undergoing surgical procedures, such as heart surgery. Therefore, the objective of the study was to characterize the nutritional profile of heart disease patients diagnosed with dysphagia. **Methods:** This was a descriptive study carried out with patients over 18 years old and diagnosed with dysphagia through speech therapy assessment. Data were collected from November 2022 to November 2023. For nutritional risk screening, the Nutritional Risk Screening tools (NRS-2002) and the Mini Nutritional Assessment short form (MAN-SF) were applied and, afterwards, the Subjective Global Assessment (SGA) for patients who presented nutritional risk. Anthropometric assessment was performed using estimated weight, height and calf circumference (LC). **Results:** The study included a sample of 59 patients, with a mean age of 84.4±9.8 years. They were predominantly female and Caucasian. The nutritional assessment highlighted that 91.5% of patients presented nutritional risk, from which 55.9% had moderate malnutrition, and 33.9% presented severe malnutrition. Regarding body mass index (BMI), 64.4% of patients were classified as underweight, and 78.4% had muscle depletion according to the LC classification. **Conclusion:** Cardiac patients diagnosed with dysphagia showed significant nutritional impairment, highlighting the importance of controlling and monitoring nutritional status. As this was a pilot study, it is necessary to complete the study sample number in order to validate the proposed research hypotheses.

RESUMO

Introdução: As doenças cardiovasculares (DCV) são as principais causas de morte no Brasil, que podem ser tratadas com métodos clínicos e/ou cirúrgicos. A disfagia é uma condição muito frequente em pacientes hospitalizados, principalmente nos submetidos a procedimentos cirúrgicos, como as cirurgias cardíacas. Com isso, o objetivo do estudo foi caracterizar o perfil nutricional de pacientes cardiopatas diagnosticados com disfagia. **Método:** Este foi um estudo descritivo, realizado com pacientes maiores de 18 anos e com diagnóstico de disfagia através da avaliação fonoaudiológica. Os dados foram coletados no período de novembro de 2022 a novembro de 2023. Para a triagem de risco nutricional foram aplicadas as ferramentas *Nutritional Risk Screening* (NRS-2002) e a Mini Avaliação Nutricional versão reduzida (MAN-SF) e, após, a Avaliação Subjetiva Global (ASG) para os pacientes que apresentaram risco nutricional. A avaliação antropométrica foi realizada através de peso estimado, estatura e circunferência da panturrilha (CP). **Resultados:** O estudo contou com uma amostra de 59 pacientes, com idade média de 84,4±9,8 anos. Pacientes eram predominantemente do sexo feminino e de etnia caucasiana. A avaliação nutricional destacou que 91,5% dos pacientes apresentaram risco nutricional, sendo que 55,9% apresentavam desnutrição moderada e 33,9% apresentavam desnutrição grave. Quanto ao índice de massa corporal (IMC), 64,4% dos pacientes foram classificados como baixo peso, e 78,4% dos pacientes apresentaram depleção muscular, conforme a classificação da CP. **Conclusão:** Os pacientes cardiopatas diagnosticados com disfagia apresentaram comprometimento nutricional, evidenciando a importância do controle e acompanhamento do estado nutricional. Uma vez que este foi um estudo piloto, torna-se necessário ampliar o número amostral do estudo, a fim de validar as hipóteses propostas desta pesquisa.

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INTRODUCTION

Cardiovascular diseases (CD) are the leading causes of death in Brazil[1]. According to a study published in 2021[1], CD accounts for 27% of total deaths, being the leading cause of death among Brazilians. These deaths are mainly due to coronary artery disease (32%), stroke (28%), and heart failure (18%)[1]. Among the treatments for cardiac diseases, there are clinical and/or surgical options, which often lead to prolonged hospitalization[2]. Dysphagia is a very common condition among hospitalized patients, especially those undergoing surgical procedures, such as cardiac surgeries[3,4]. In the population with CD, oropharyngeal dysphagia has an incidence of 2.7% to 51%[2].

According to the World Gastroenterology Organization, dysphagia can be defined as difficulty in initiating the swallowing process or the sensation of food or liquids being retained in the laryngeal or esophageal cavity[5], a condition that can lead to food regurgitation, bronchoaspiration, heartburn, hoarseness, hiccups, and odynophagia[5]. Although it occurs in various clinical conditions, studies indicate that some risk factors may influence the development of dysphagia in cardiac patients, such as prolonged mechanical ventilation (MV), advanced age, previous neurological pathology (especially stroke), low calf circumference (CC), and malnutrition[6].

It is common for dysphagic patients to present a higher nutritional risk, as the need to change the consistency of food and use thickeners to avoid the risk of bronchoaspiration may result in reduced acceptance of diet and liquids, leading to malnutrition and dehydration[7]. Studies indicate that malnutrition has a prevalence of 36.8% and nutritional risk of 55.3% in people diagnosed with dysphagia[7].

Malnutrition in hospitalized cardiac patients with dysphagia has a multifaceted negative impact. In addition to compromising cardiovascular health, increasing the risk of cardiac complications, such as arrhythmias and heart failure, it also weakens the immune system, increasing susceptibility to infections. This condition can lead to loss of muscle mass and weakness, making rehabilitation after acute cardiovascular events difficult. Malnutrition interferes with the effectiveness of medical treatments, reducing the body's response and increasing the risk of complications during treatment[5-8].

Given the high prevalence of dysphagia and the scarcity of studies evaluating it in cardiac patients, the present study aimed to characterize the nutritional status of cardiac patients diagnosed with dysphagia.

METHODOLOGY

This was a descriptive cross-sectional pilot study, carried out on patients diagnosed with dysphagia, carried out in a cardiology reference hospital from November 2022 to November 2023. The study followed the prerogatives of the STROBE checklist.

In order to participate in the study, patients had to be over 18 years of age, clinically stable and able to undergo a nutritional history, with assessment by the hospital's speech therapist and diagnosis of dysphagia. If the patient presented any clinical condition that made it impossible to answer the questions, the person responsible for the patient was contacted instead. The exclusion criteria were composed of amputee patients, patients with ascites, pregnant and postpartum women, undergoing enteral/parenteral nutritional therapy (TNE/TNP) and refusal to participate.

The variables were collected at two points after the diagnosis of risk for dysphagia using the Speech Therapy Protocol for Risk Assessment of Dysphagia (PARD). Initially, sociodemographic and clinical data were obtained from the medical records, including reason for hospitalization, comorbidities, surgeries, pre-existing or acquired neurological condition during hospitalization, need for ventilatory support, and duration of mechanical ventilation when applicable (less than or greater than 48 hours). This data was recorded in a specific form developed by the researcher. Next, a complete nutritional assessment was conducted by a trained nutritionist, using estimated weight and height, as well as the measurement of calf circumference (CC) to evaluate muscle mass. For weight estimation, the formula of Chumlea et al. (1988)[9] was used, with alternative anthropometric measurements including knee height (KH) and arm circumference (AC), considering gender and age. AC was measured with the arm flexed at a 90-degree angle, while KH was obtained by measuring the distance between the heel and the head of the fibula. Height was estimated by measuring the length of the ulna, according to BAPEN[10]. The proximal end (olecranon) and the styloid process were palpated, measuring, in centimeters, the length between these two ends[10].

Body mass index (BMI) was calculated using the estimated data and classified according to age group by the World Health Organization[11] for adults or the Pan American Health Organization[12] for elderly individuals over 60 years. CC was classified as preserved or reduced according to Barbosa-Silva (2016)[13], based on gender. Values below 33 cm for women and 34 cm for men were associated with reduced muscle mass. To measure CC, the patient was asked to flex their right leg at a 90-degree angle, with the tape measure positioned at the point of greatest calf prominence[13]. In cases of patients with lower limb edema, this measurement was excluded.

All patients were screened for nutritional risk using validated nutritional risk screening tools according to age group: Nutritional Risk Screening (NRS-2002)[14] for those under 60 years and the short-form of the Mini Nutritional Assessment

(MNA-SF)[15] for those over 60 years. The presence of malnutrition was assessed according to the criteria of the Nutrition Subjective Global Assessment (NSGA)[16]. Diet consistency and liquid thickening were classified according to the International Dysphagia Diet Standardisation Initiative[17].

The study followed the prerogatives of CNS Resolution 466/2012 and Law 13.853 of 2019. It was developed with the authorization of the Research Ethics Committee of the Institute of Cardiology - University Foundation of Cardiology (No. 6.048.977). All participants signed the Informed Consent Form (ICF).

The sample size was estimated at 381 patients, with a 10% increase to compensate for possible losses and refusals, totaling 424. The calculation was performed using the Wald method, considering a 95% confidence level and an expected 55% for nutritional risk, as reported by Silva et al.[7].

Descriptive statistics were calculated to characterize the sample, including mean and standard deviation for parametric quantitative variables, and absolute and relative frequency for categorical variables. All analyses were performed using the Statistical Package for Social Science® (SPSS) software (version 26).

RESULTS

This study evaluated the diagnosis of dysphagia in patients with heart disease. Patient characteristics are presented in Table 1. A total of 59 patients were included, with an age of 84.4±9.8 years, predominantly female (59.3%), and Caucasian (86.4%). Regarding the reason for hospitalization, the majority of patients were admitted due to congestive heart failure (CHF), acute myocardial infarction (AMI), or pneumonia.

Table 1 – Sociodemographic characteristics of patients included in the study.

Characteristics	Total sample (n = 59)
Age (years)	84.4 ± 9.8
Sex	
Feminine, n (%)	35 (59.3)
Male, n (%)	24 (40.6)
Ethnicity	
Caucasian, n (%)	51 (86.4)
Blacks, n (%)	8 (13.6)
Hospitalization motivation	
Cardiac insufficiency, n (%)	16 (27.2)
Acute myocardial infarction, n (%)	12 (20.3)
Pneumonia, n (%)	7 (11.9)
Others, n (%)	24 (40.6)

n = sample size. Data expressed in n (%) or mean±standard deviation.

Data from Table 2 reveal information about dysphagia and nutritional status. More than half of the study sample presented a diagnosis of mild dysphagia, totaling 62.7% of the sample. However, 22% of patients diagnosed with moderate to severe dysphagia, and 15.3% classified as pre-dysphagia. The distribution of the diet indicates that 49.2% used a pureed diet with slightly thickened liquids, while 15.2% required a diet with soft and chopped foods with thin liquids.

The nutritional assessment highlights that 91.5% of patients presented nutritional risk, with 55.9% showing moderate malnutrition and 33.9% severe malnutrition. Regarding BMI, 64.5% of patients are classified as underweight. As for muscle mass, 78.4% showed depletion of muscle mass as measured by CC, as described in Table 2.

Table 2 – Dysphagia and nutritional status of patients included in the study.

	Total sample size (n=59)
Degree of dysphagia	
Mild dysphagia	37 (62.7)
Moderate to severe dysphagia	13 (22.0)
Presbyphagia	9 (15.3)
Type of diet	
Liquidized paste with slightly thickened liquids	29 (49.2)
Soft and chopped with thin liquids	9 (15.2)
Easy to chew with thin liquids	21 (35.6)
Nutritional risk	
Present	54 (91.5)
Absent	5 (8.5)
Malnutrition	
Absence of malnutrition	6 (10.0)
Moderate	33 (55.9)
Serious	20 (33.9)
BMI	
Low weight	38 (64.4)
Eutrophy	15 (25.4)
Overweight	3 (5.1)
CC	
Muscle depletion	40 (78.4)

n = sample size; BMI = body mass index; CC = calf circumference. Data expressed in n (%). For BMI, 56 patients were considered. For CC, 40 patients were considered.

Out of the 59 patients included in the study, 8 of them (13.6%) underwent surgical procedures. Only one patient (1.7%) had dysphagia prior to the surgical procedure. Among

patients who required mechanical ventilation (MV), 11.9% used it before the diagnosis of dysphagia, with 6.8% exceeding 48 hours of use. It was also observed that 66.1% of patients did not present neurological conditions as the reason for hospitalization. However, among those who did, the most frequent condition was stroke, present in 23.7% of cases.

DISCUSSION

Dysphagia, considered a swallowing difficulty, is a frequent occurrence in cardiac patients, with substantial implications on the nutritional status and clinical prognosis of this population. This study identified patients with an average age of 84 years or older, corroborating a study with 229 elderly individuals included, which indicated an increased risk for developing this condition in individuals aged 80 or older, with a prevalence of 33% in this group[18]. An integrative review also revealed a higher frequency of dysphagia in Caucasian women, which aligns with our results, showing a higher number of white women with the condition[19].

In the context of heart diseases, CHF and AMI are highlighted as the most common. Similarly, a study in Paraná, Brazil, demonstrated that these pathologies were the main reasons for hospital admissions in cardiology reference hospitals, especially among the elderly population[20]. It was observed that 52.7% of the sample in this study falls into a low-income family. This socioeconomic condition is considered to be determinant, influencing the illness profile of individuals[21].

Regarding the degree of dysphagia, the presence of mild, moderate to severe dysphagia, and pre-dysphagia was identified in this study. Swallowing disorders were associated with surgical procedures, mechanical ventilation, and neurological conditions. These results corroborate a retrospective clinical study in São Paulo, Brazil, with a sample of 100 patients, which indicated these factors as the main risk factors for developing dysphagia in cardiac patients[2]. Pre-dysphagia was associated with the older age population, being defined as the natural aging of the responsible and assisting structures of swallowing[22].

A literature review observed an association between the development of malnutrition and sarcopenia due to decreased energy-protein intake, in line with the results of the present study[7]. Despite presenting other causes of development, mild to moderate dysphagia is also associated with advanced age, developing the same nutritional consequences mentioned earlier[7].

The feeding of individuals with dysphagia often requires modifications in the consistency and texture of foods, which can result in reduced acceptability and lower dietary adherence, contributing to a nutritional deficit among this population[7]. Our study showed that 49.2% of the participants required adjustments in the consistency of diet and liquids, which was also associated with a lower food acceptance and subsequent nutritional risk.

Despite the knowledge of the high rate of malnutrition in hospitalized elderly individuals and its negative impact on the clinical picture, this study highlights that 91.5% of patients were malnourished or at risk of malnutrition. Similar results were observed in a cross-sectional study conducted with 28 hospitalized patients, revealing a prevalence of malnutrition in 93% of the sample[23]. The data analysis also pointed to the need for special attention to diet and nutritional assessment to improve the clinical management of these cases.

Anthropometric assessment revealed a high percentage of patients with low weight and muscle depletion, indicating an association with malnutrition and nutritional risk. Although 78.4% of the study population presented muscle depletion, the clinical assessment of CP can be difficult to interpret in situations of increased subcutaneous adipose tissue or in a state of body edema, requiring correlation with other parameters for a more accurate diagnosis of nutritional status in these cases[24].

Dysphagia can be triggered by various factors, as demonstrated in a study with hospitalized cardiac patients in São Paulo, Brazil, which identified stroke, malnutrition, and prolonged intubation as predictive risk factors for oropharyngeal dysphagia[2]. These findings converge with the results of our study, highlighting the relevance of these factors as potential triggers of dysphagia in cardiological contexts, and emphasizing the need for integrated clinical approaches to prevent and manage this condition in cardiac patients.

Even though this study obtained important results, it is crucial to highlight its limitations. Firstly, the sample size did not reach the ideal level due to underdiagnosis, a common reality in the hospital environment. However, active patient search was conducted, even before the indication by the speech therapy team, to increase case numbers. Secondly, the limitation of adipose tissue in body composition analysis was identified. This limitation can be mitigated by adjusting for BMI. This adjustment will be considered in future studies with this population. However, it was not applied in this study due to a lack of an institutional protocol, which made it impossible to obtain these data.

Despite the limitations mentioned, this study has several strengths. Firstly, the significance of the results obtained is highlighted, contributing to the understanding of the topic at hand. Additionally, the active search for patients before the intervention of the speech therapy team demonstrates an additional effort to maximize the representativeness of the sample. Furthermore, the identification of the limitation of adipose tissue in body composition analysis shows a critical reflection on the methods used, signaling possible improvements in

future studies. Although adjustment for body mass index was not applied in this study due to the absence of an institutional protocol, recognition of this issue opens up space for future more comprehensive and refined investigations.

CONCLUSION

The study at hand highlights the recurrence of dysphagia in patients with heart disease, especially in the elderly population. The high percentage of patients at nutritional risk, malnutrition, and underweight underscores the urgency of specific nutritional interventions for this population. Due to the limitation of the sample size, it is necessary to increase the sample number of the study in order to validate the proposed research hypotheses.

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