PROFILE OF PATIENTS USING ALTERNATIVE FEEDING ROUTE IN A GENERAL HOSPITAL

Perfil de pacientes em uso de via alternativa de alimentação internados em um hospital geral

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ABSTRACT

Purpose: to characterize the population submitted to administration of alternative feeding route admitted to a general hospital in the state of Alagoas. **Method:** data from medical records of 229 patients admitted to adult infirmary were investigated. Data referring to the administration of alternative feeding route in use and clinical aspects related to swallowing disorders were analyzed. **Results:** there was a predominance of male participants (55.02%) in the sample. From the total sample, 70.3% of participants were diagnosed with a neurological disease and most of them used the nasogastric tube (82.53%) as feeding route. There was an association between the variables pneumonia and dysphagia (p = 0.0098). However, no association between malnutrition and dysphagia was found (p = 0.0759). There was also a high frequency of absence of data concerning symptoms of feeding difficulty as well as about justification for the use of the alternative feeding route. **Conclusion:** the population studied presented risk factors for development of dysphagia. The shortage of data revealed the little importance given to functional manifestation at the hospital context.

KEYWORDS: Deglutition Disorders; Adult; Enteral Nutrition; Epidemiology

INTRODUCTION

During hospitalization, some patients – depending on the clinical conditions associated with certain underlying diseases – may experience functional limitations for oral ingestion of food and may present the need for the administration of an alternative feeding route in order to secure an adequate nutritional status [1].

The selection of the nutritional route depend on the clinical conditions related to swallowing, the integrity of the gastrointestinal tract, and the general condition of the patient. Enteral nutrition – which access is secured by devices such as nasogastric tube, nasoenteral tube, and ostomy (gastrostomy and enterostomy) – allows the supply of food directly into the digestive tract. Enteral nutrition is commonly indicated when there is inability of oral intake, functional deficits or morphological conditions as long as the gastrointestinal tract of the patient is normally functioning[2]. One indication of gastrostomy is the use of enteral nutrition for prolonged periods and nasoenteral tubes can cause complications such as migration or spontaneous withdrawal, ischemic lesions in the nose, throat or esophagus, stricture and tracheoesophageal fistula[3]. Dysphagia has been reported in the literature as the main reason

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for gastrostomy indication[4]. Faced with major losses of nutrient absorption by the digestive tract, the parental route – which replenishes the nutrients necessary for survival – is recommended. Parenteral nutrition can also be used to supplement enteral nutrition, especially in face of metabolic prejudice, favoring the nutritional recovery of the patient [5].

It is necessary to understand the pathophysiology and the general health implications of swallowing disorder as it is one of the reasons for the administration of alternative feeding route. The act of swallowing is the result of a complex neuromotor mechanism which coordination will result in the effective transport of food from mouth to stomach[6]. Inadequacies in this process are described as dysphagia and it impacts the nutritional and/or hydration status, and/or lung health as well as nutritional pleasure[7]. In neurogenic dysphagia, the central and/or peripheral neural structures that control the complex mechanisms of swallowing are affected and this type of disorder is common in patients who are hospitalized for neurological diseases[8-10]. In contrast, in the mechanical dysphagia, the neurological control is intact but the anatomical structures responsible for deglutition had suffered structural damage[11].

Several authors have described the high incidence of dysphagia in neurological diseases. The observed incidence of dysphagia ranges from 5% to 75.5% in patients with cerebrovascular accident (CVA) during hospitalization, a finding also observed in studies with patients on intensive care units [12-15].

The level of alertness and cognition has also been described by several authors as a relevant factor for the performance of swallowing as oral intake inefficiency is common in cases of psychomotor agitation, and impaired attention, concentration or memory[9,16]. A study with patients who received tracheal intubation concluded that patients with neurological involvement were associated with poorer outcomes in swallowing evaluation and decreased possibility of oral feeding, conditions directly related to the cognitive-behavioral framework [17].

The clinical assessment in patients with dysphagic signs or patients who are at risk for dysphagia favors the differential diagnosis of swallowing disorders and the definition of conducts aimed at safe and efficient reintroduction of oral nutrition, prevention of complications, reduction of hospital costs, in addition to improved quality of life [18-21].

Although swallowing disorders have been investigated in diverse populations, there are few studies on the characterization of patients using alternative feeding route and its relationship with the dysphagia. Considering the clinical setting of the patient with alternative feeding route, the present study aimed to characterize the population using alternative feeding route admitted to a general hospital without Speech- Pathology service.

METHOD

This research consisted on a prospective cross-sectional descriptive study that was carried out by the analysis of 229 clinical records of patients hospitalized in adult wards between period of April and June, 2010 at a general hospital of reference at the State of Alagoas.

A daily survey was carried out to identify patients using alternative feeding route who were admitted to adult wards of the hospital. The survey included checking the nursing stations to identify in the prescription of the day the indicated diet or identification of patients. Subsequently, data were collected regarding gender, age, current medical diagnosis, alternative feeding route used, complaint or report of swallowing difficulties as well as description of respiratory and nutritional status. The information was registered on a protocol designed by the researchers (Figure 1).

The inclusion criteria were: patients of both genders with more than 18 years of age, hospitalized in adult infirmaries who were using alternative feeding routes independently of the underlying disease. We excluded patients whose records were incomplete regarding the variables adopted for the study. Sample size calculation was not performed to define the number of participants. In contrast, all patients who were hospitalized between April and June 2010 who fulfilled the inclusion criteria were included in the sample.

This study was approved by the Ethics and Research Committee of the State University of Health Sciences of Alagoas (Universidade Estadual de Ciências da Saúde de Alagoas – UNCISAL) under protocol number 1255/09.

The data collected were stored in a spreadsheet and analyzed descriptively and analytically using the SPSS ® software (version 15.0 for Win, SPSS Inc). The chi-square test was used to analyze the relationship between the variables with a significance level of 5% ($p < 0.05$).

PROFILE OF PATIENTS USING ALTERNATIVE FEEDING ROUTE IN A GENERAL HOSPITAL - PROTOCOL FOR DATA COLLECTION

I) Identification data
Hospital bed: **Infirmaries:**
Hospital Record nº:
Age:
Gender:
( ) 1- Men
( ) 2- Women

II) Clinical aspects
Feeding route:
( ) 1- NGT
( ) 2- NET
( ) 3- PEG
( ) 4- Jejunostomy
( ) 5- Parenteral

Underlying disease:
( ) 1- Neurological
( ) 2- Cardiologic
( ) 3-Gastrointestinal
( ) 4- Infection
( ) 5- Trauma
( ) 6- Respiratory
( ) 7- Metabolic
( ) 8- Others

III) Feeding aspects
Signal/Symptoms of feeding difficulty
( ) 1- Not presented
( ) 2- Inappetence
( ) 3- Choking/Cough
( ) 4- Refusal/Low intake

Clinical justification for the use feeding route
( ) 1- Not presented
( ) 2- Decrease consciousness level
( ) 3- Severe general state
( ) 4- Swallowing difficulty
( ) 5- Sleepiness

Dysphagia
( ) 1- No
( ) 2- Yes

Subnutrition
( ) 1- No
( ) 2- Yes

Pneumonia
( ) 1- No
( ) 2- Yes

Figure 1 – Protocol for data collection

RESULTS

The study sample consisted of 229 patients, 126 (55.02%) men and 103 (49.97%) women. Participants were classified according to age. Thirty-one participants (13.53%) were between 18 and 38 years, 48 (20.96%) were between 39 and 59 years, 110 (48.03%) were between 60 and 80 years, and 40 (16.5%) were between 81 and 100 years of age.

The underlying diseases (Table 1) presented by the participants were grouped into six categories: neurological disorders (comprising stroke, traumatic brain injury (TBI), dementia, spinal cord trauma, and central tumor); cardiovascular diseases (heart diseases and hypertension); gastrointestinal disorders (gastric hemorrhage, abdominal distention, fistula, appendicitis); respiratory diseases (respiratory insufficiency, chronic obstructive pulmonary disease – COPD); trauma (gunshot wounds – abdominal, chest and limbs; multiple trauma; facial trauma); and other diseases (diabetes mellitus, liver disease, infection of bedsores; kidney diseases, psychiatric disorders, head and neck cancer, and hematologic diseases). The most prevalent category of disease was the neurological one. Regarding the quantity of diseases, only 13.10% of participants had three or more diagnosed diseases. The most used feeding route was the nasogastric (SNG) (82.53%), while the parenteral was observed in 1.74% of cases. The clinical alterations of malnutrition and pneumonia were present in 10.04% and 35.80% of cases, respectively.

Table 1 – Sample description regarding clinical aspects

Clinical aspects	N	%
Underlying disease*		
Neurological	161	70.30
Cardiologic	70	30.56
Gastrointestinal	24	10.48
Respiratory	11	4.80
Trauma	18	7.86
Others	42	18.34
Number of diseases per subject		
One	116	50.65
Two	83	36.24
Three or mores	30	13.10
Feeding route		
NGT	189	82.53
NET	27	11.79
PEG	4	1.74
Mixed	5	2.18
Parenteral	4	1.74
Pneumonia		
Yes	82	35.80
No	147	64.19
Subnutrition		
Yes	23	10.04
No	206	89.95

NGT = Nasogastric tube; NET= Nasoenteral tube; PEG= Gastrostomy.

According to Table 2, the most used alternative feeding route in all groups of primary disease was the nasogastric tube ($p < 0.0001$). The use of the gastrostomy (PEG) was observed only in patients with neurological diseases, whereas parenteral nutrition was more common in the group of gastrointestinal disorders.

Table 2 – Distribution of alternative feeding route according to underlying disease

Underlying disease	Feeding route										p value
	NGT		NET		PEG		Mixed		Parenteral		
	N	%	N	%	N	%	N	%	N	%	
Neurologic	133	58.07	22	9.6	3	1.31	5	2.18	1	0.43	<0.0001
Cardiovascular	62	27.07	5	2.18	-	-	-	-	1	0.43	<0.0001
Gastrointestinal	20	8.73	1	0.43	-	-	-	-	2	0.87	NA
Trauma	12	5.24	5	2.18	-	-	-	-	-	-	NA

NGT = Nasogastric tube; NET= Nasoenteral tube; PEG= Gastrostomy; NA= Non-available test. *statistically significant values (p< 0,05) – Chi-square test

When considering the reasons for the clinical use of alternative feeding route (Table 3), there was a statistically significance difference (p <0.0001) between patients using nasogastric tube (NGT) and nasoenteral tube (NET). However, the low frequency of patients using other feeding routes prevented the application of tests on the group of gastrointestinal diseases and traumas. The decreased level of consciousness (DLC) was the most frequent justification and it was associated with the use of NGT and NET in 41 (17.09%) and 3 (1.31%) of the cases, respectively.

Table 3 – Distribution of clinical justification according to alternative feeding route

Feeding route	Justification for the use of feeding route										p value
	DCL		Sleepiness		SGS		Swallowing difficulty		Not presented		
	N	%	N	%	N	%	N	%	N	%	
NGT	41	17.09	2	0.87	4	1.74	8	3.49	75	32.75	<0.0001*
NET	3	1.31	-	-	-	-	1	0.43	23	0.10	<0.0001*
PEG	-	-	-	-	-	-	-	-	4	1.74	NA
Mixed	1	0.43	-	-	-	-	-	-	4	1.74	NA
Parenteral	-	-	-	-	-	-	-	-	4	1.74	NA

NGT = Nasogastric tube; NET= Nasoenteral tube; PEG= Gastrostomy; DCL = decrease consciousness level; SGS = severe general state; NA= Non-available test. Not presented = not described on medical records;
*statistically significant values (p< 0,05) – Chi-square test

Regarding the justifications for the use of the alternative routes according to group of underlying disease, the decreased level of consciousness was also the most often described clinical reason in the medical records. The swallowing difficulty was recorded only in the groups of neurological and cardiovascular diseases. There was a statistically significant difference (p <0.0001) when considering the distribution of clinical justification for the base disease group (Table 4).

Table 4 – Distribution of clinical justification of feeding route according to underlying disease

Underlying disease	Justification for the use of feeding route										p value
	DCL		Sleepiness		SGS		Swallowing difficulty		Not presented		
	N	%	N	%	N	%	N	%	N	%	
Base disease	32	13.97	1	0.43	3	1.31	9	3.93	119	51.96	<0.0001
Neurologic	14	6.11	-	-	1	0.43	2	0.87	51	22.27	<0.0001
Cardiovascular	2	0.87	1	0.43	-	-	-	-	20	8.73	<0.0001
Gastrointestinal	4	1.74	-	-	2	0.87	-	-	11	4.80	<0.0001
Trauma	32	13.97	1	0.43	3	1.31	9	3.93	119	51.96	<0.0001

NGT = Nasogastric tube; NET= Nasoenteral tube; PEG= Gastrostomy; DCL = decrease consciousness level; SGS = severe general state; NA= Non-available test. Not presented = not described on medical records;
*statistically significant values (p< 0,05) – Chi-square test

Table 5 illustrates the distribution of signals and symptoms of feeding difficulty according to the feeding route in use. Among the patients in the sample who had choking/coughing, all made use of enteral route. There was no record of signs and symptoms of feeding difficulty in the group of subjects receiving parenteral nutrition. The absence of records referring to signs and symptoms of feeding difficulty was significant in groups of patients using NGT and NET (p <0.0001).

Table 5 – Distribution of signals and symptoms of feeding difficulty according to alternative feeding route

Feeding route	Signals and Symptoms										p value
	Inappetence		Choking/ cough		Refusal/ Low intake		Extraoral scape		Not presented		
	N	%	N	%	N	%	N	%	N	%	
NGT	6	2.62	16	6.98	21	9.17	2	0.87	144	62.8	<0.0001*
NET	1	0.43	6	2.62	2	0.87	2	0.87	16	6.98	<0.0001*
PEG	2	0.87	1	0.43	1	0.43	-	-	-	-	NA
Mixed	-	-	1	0.43	-	-	1	0.43	3	1.31	NA
Parenteral	-	-	-	-	-	-	-	-	4	1.74	NA

NGT = Nasogastric tube; NET= Nasoenteral tube; PEG= Gastrostomy; DCL = decrease consciousness level; SGS = severe general state; NA= Non-available test. Not presented = not described on medical records;
*statistically significant values (p< 0,05) – Chi-square test

The signs and symptoms of feeding difficulty (Table 6) were predominantly absent on the records of all disease groups (p <0.001). Twenty patients (8.73%) presented cough associated with neurological diseases, while that refusal/low intake was associated with cardiovascular disease in 7 (3.05%) participants.

Table 6 – Distribution of signals and symptoms of feeding difficulty according to underlying disease

Underlying disease	Signals and symptoms										p value
	Inappetence		Choking/ cough		Refusal/ Low intake		Extraoral scape		Not presented		
	N	%	N	%	N	%	N	%	N	%	
Neurologic	5	2.18	20	8.73	18	7.86	4	1.74	117	51.0	<0.001*
Cardiovascular	4	1.74	2	0.87	7	3.05	1	0.43	54	23.5	<0.001*
Gastrointestinal	-	-	2	0.87	3	1.31	-	-	18	7.86	<0.001*
Trauma	1	0.43	2	0.87	-	-	1	0.43	13	5.67	<0.001*

Not presented = not described on medical records;
*statistically significant values (p< 0,05) – Chi-square test

The distribution of signs and symptoms of feeding difficulty according to underlying disease (Table 7) revealed high frequency of absence of records on the three groups, and higher frequency of choking/ cough and refusal/low intake in the group of patients with an underlying disease.

According to the results presented in Table 8, there was an association between dysphagia and pneumonia (p = 0.0098), which was not observed between dysphagia and malnutrition (0.0759).

Table 7 – Distribution of signals and symptoms according to number of underlying diseases

Symptoms	Number of underlying diseases						p value
	One		Two		Three or more		
	N	%	N	%	N	%	
Inappetence	6	2.62	2	0.87	1	0.43	NA
Choking/cough	16	6.98	7	3.05	1	0.43	0.0008*
Refusal/ low intake	13	5.67	8	3.49	3	1.31	0.0439*
Extraoral scape	2	0.87	3	1.31	-	-	NA
Not presented	79	34.49	63	27.51	25	10.9	<0.0001*

Not presented = not described on medical records;
*statistically significant values (p< 0,05)

Table 8 – Association between dysphagia and pneumonia and subnutrition diagnosis

Clinical findings	Dysphagia				p value
	Yes		No		
	N	%	N	%	
Pneumonia					
Yes	11	4.80	71	31	0.0098*
No	6	2.62	141	61.57	
Subnutrition					
Yes	4	1.74	19	8.29	0.0759
No	13	5.67	193	84.27	

*Statistical significant values (p< 0,05). Chi-Square test.

DISCUSSION

The results obtained in this study showed that 31.30% of the sample consisted of elderly individuals (participants with more than 60 years of age). In these individuals, the aging effect on the swallowing process, associated with health changes, make the mechanism more vulnerable to disorders such as dysphagia. Changes in the oral cavity associated with aging can lead to reduced mobility of orofacial structures, loss of taste papillae and teeth, which in turn interferes on the preparation of the bolus and the efficiency of oral intake [22, 23].

The use of alternative feeding routes in patients under hospital care has been reported by several studies, which relate swallowing disorders to diseases such as stroke, TBI, dementia, head and neck cancer or factors such as decreased level of consciousness, cognitive impairment, severe general condition and prolonged use of mechanical ventilation [15,24,25]. In the present study, several underlying diseases were observed, but the majority of patients (70.30%) had a diagnosis of some neurological involvement. The association between dysphagia and neurological disorders has also been reported in previous studies[10,12,13,18,24]. The cardiologic diseases had the second highest incidence (30.56%) – a group that may require prolonged enteral support, and in some cases gastrostomy, when complicated by central neuropathy [26].

In the presence of multiple diseases, the risk for the development of dysphagia is marked, often responding to worsening of the condition of the patient. The decreased level of consciousness (DLC) was considered in a previous study a strong predictor for the risk of aspiration given the lower ability of the patient to develop protective mechanisms when he is on decreased alert[16]. In the present study, the DLC was the most commonly used justification for the use of alternative feeding routes on all groups (p <0.0001). Delirium (transient cognitive impairment with acute and abrupt onset related to an organic cause) is a clinical finding commonly observed in the geriatric population and it has implications on safe and efficient oral intake. A study with elderly patients diagnosed with delirium during hospitalization showed that 42.40% of the Speech-Language Pathology conducts consisted on the indication of enteral route and 21.20% of the mixed route. In these cases, enteral feeding aims to prevent aspiratory pneumonia, nutritional deficits and even death by starvation [27].

Pneumonia was present in 35.80% of the cases, and an association between this finding and dysphagia (p = 0.0098) was observed. Literature data regarding the relationship between tracheal aspiration and alteration in lung health is controversial. One study reported that only 50% of patients with aspiration presented aspiration pneumonia, considering as predisposing factors the origin, volume, clinical condition of the patient and pathogenicity of the aspirated content[28]. Another aspect to be considered is that although the probes are commonly adopted as an alternative feeding route for patients with swallowing disorders, questions on the effectiveness of using this resource in the prevention of pulmonary complications are raised for not excluding the risk of high secretions aspiration [29]. A study with 173 patients with severe neurological injury found that 81% of those who had pneumonia made exclusive use of alternative feeding route[17]. In contrast, a study of post stroke patients found that the incidence of pneumonia was significantly higher in patients using oral diet compared those using feeding tube [30]. These authors discuss the relationship between the use of NGT and NET with increased bacterial colonization (biofilm) and the desensitization of the protection mechanisms of the upper airways. The effect of probe size on the upper and lower esophageal sphincter is also cited as one of the factors that favor bronchoaspiration [29 30].

The NGT and NET routes were the most prevalent feeding routes, being observed in 82.53% and 11.79% of cases, respectively. Gastrostomy was observed in only 1.74% of the sample, possibly because NGT and NET are the most common route in cases of chronic swallowing disorders and/or irreversible damage. Given that the use of enteral nutrition aims to prevent malnutrition and complications in patients with severe clinical conditions or with swallowing disorders [1,31], the use of this resource by participants of the study may explain the low frequency of malnutrition, cited in only 10.04% of cases, as well as the lack of association of this comorbidity and the presence of dysphagia (p = 0.0759). It is believed that the clinical difficulties with bedridden patients can lead to underdiagnosis of nutritional disorders.

A multicenter study in Brazil involving 4,000 patients hospitalized in the Public Health System (SUS) in various regions of the country found that of the 48.9% of patients diagnosed with malnutrition, 10.10% were using enteral feeding route [32]. Another study carried out with patients with enteral nutrition prescription observed that 29% of the 100 subjects who underwent nutritional assessment preceding the use of the route were classified as malnourished. In both studies, dysphagia was not considered a variable [33].

Although only 18 (6.55%) patients of the sample presented a clinical record of dysphagia, events such as choking/coughing, refusal to eat/poor oral intake and/or loss of appetite were described on the records of the studied cases. Therefore, it is believed that this disorder is underdiagnosed and its incidence may be more significant since the swallowing dysfunction is one of the major reasons for the indication of an alternative feeding route, besides the high prevalence of neurological conditions as underlying diseases, which often concomitantly occur with transient or permanent dysphagia.

The absence of effective Speech-Language Pathology intervention at the institution where the study was conducted seems to contribute to this reality, given that the Speech-Language Pathologist is the qualified professional to prevent, evaluate and rehabilitate swallowing disorders.

In recent years there has been a significant increase in the registration of dysphagia as primary or secondary diagnosis in hospital records. This picture seems to be the result of greater attention intended to the symptoms of swallowing disorders and its documentation in medical records. It is possible that the increase in life expectancy of the population and the increased survival afforded by the advance of medical and hospital care also contribute to this reality [34].

The impact of Speech-Language Pathology intervention at the hospital environment has been scientifically proven, even providing reduced hospital costs, as many patients can progress to full oral feeding no more requiring a complementary route and further minimizing the risk of complication of the general condition when swallowing disorders are properly diagnosed and rehabilitated [20,21,35-37]. Considering that some patients have poor prognosis and may not progress exclusively to oral route, even when accompanied by Speech-Language Therapy, it is essential to define the procedure for the conduct of these cases, including programming or maintenance of the gastrostomy.

CONCLUSIONS

The characterization of the sample regarding age and the most prevalent underlying diseases associated with the use of alternative feeding route suggest that part of this population presents dysphagia or are at risk for the developing this disorder. The constant lack of data on disabilities/limitations related to feeding demonstrated the little clinical relevance given to functional manifestations by the hospital where the study was conducted.

RESUMO

Objetivo: caracterizar a população em uso de via alternativa de alimentação internada em um hospital geral de referência. **Método:** estudo transversal prospectivo, tendo-se realizado coleta de dados em 229 prontuários de pacientes em uso de via alternativa de alimentação internados em enfermarias adultas de um hospital geral, identificando-se dados referentes à via alternativa de alimentação em uso, justificativas clínicas, doença(s) de base e demais aspectos clínicos relacionados aos distúrbios de deglutição. **Resultados:** houve predomínio do sexo masculino (55,02%); 70,3% dos pacientes apresentaram diagnóstico de alguma doença neurológica e a via de alimentação mais utilizada foi a sonda nasoenteral (82,53%). Embora a pneumonia e a desnutrição tenham sido diagnosticadas na minoria dos casos (35,08% e 10,04%), houve associação entre as variáveis pneumonia e disfagia (p=0,0098), não ocorrendo o mesmo entre desnutrição e disfagia (p=0,0759). A disfagia foi citada em apenas em 6,55% dos casos. Observou-se, ainda, alta frequência de ausência de dados referente aos sinais e sintomas de dificuldade de alimentação e de justificativas para indicação da via alternativa de alimentação prescrita. **Conclusão:** embora a população estudada tenha apresentado fatores de risco para desenvolvimento de distúrbios da deglutição, como doenças de base com alta ocorrência de disfagia e alteração do nível de consciência e/ou sonolência, a baixa frequência do diagnóstico da disfagia e a constante falta de dados relacionados ao contexto alimentar revelaram a pouca importância dada às manifestações funcionais pela unidade hospitalar estudada.

DESCRITORES: Transtornos de Deglutição; Adulto; Nutrição Enteral; Epidemiologia

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