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Trabajo Original

Nutrición artificial

Nutritional profile and mortality in patients undergoing percutaneous endoscopic gastrostomy

Perfil nutricional y mortalidad en pacientes sometidos a gastrostomía endoscópica percutánea

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Abstract

Background: malnutrition is a common problem in hospitalized patients, being associated with increased morbidity, mortality and costs. Multiple factors contribute to a deficient nutritional status, making malnutrition the cause or consequence of severe diseases. Percutaneous endoscopic gastrostomy (PEG) is a minimally invasive procedure indicated for long-term administration of enteral nutrition in patients with limited ability for oral intake who have an intact, functional gastrointestinal tract. The aim of this study was to determine the profile of patients undergoing PEG in a tertiary hospital in southern Brazil.

Methods: single-center retrospective study of all patients who underwent PEG from January 1st to December 31st, 2016, in a private tertiary hospital located in southern Brazil. Data were collected retrospectively from the patients' medical records, including nutritional status, indications, complications and outcomes.

Results: one hundred and thirty-three patients underwent PEG at our institution and were eligible for inclusion in the study. Median patient age was 82 years, and 57.9% were females. The main indication for PEG was dementia syndrome, followed by stroke. As much as 68.4% were diagnosed as severely malnourished and 23.0% had procedure-related complications.

Conclusions: PEG tubes are being increasingly used for enteral nutrition in patients with dysphagia or inability to maintain adequate nutritional intake. The findings of the present study highlight the importance of regular nutritional risk screening by a multidisciplinary team, paying special attention to the patient's nutritional status and conditions that may place the patient at risk of developing dysphagia, with the implementation of measures to minimize malnutrition in hospitalized patients.

Key words:

Percutaneous endoscopic gastrostomy. Enteral nutrition. Nutritional support. Complications.

Resumen

Introducción: la desnutrición es común en pacientes hospitalizados y se está convirtiendo en causa o consecuencia de enfermedades graves, asociándose a morbilidad, mortalidad y costos aumentados. Múltiples factores contribuyen a un estado nutricional deficiente. La gastrostomía endoscópica percutánea (PEG) es un procedimiento mínimamente invasivo para la administración de nutrición enteral en pacientes con capacidad limitada de ingesta oral que tengan el tracto gastrointestinal intacto y funcional. El objetivo de este estudio fue determinar el perfil de pacientes sometidos a PEG en un hospital terciario del sur de Brasil.

Métodos: estudio retrospectivo unicéntrico de todos los pacientes sometidos a PEG del 1 de enero al 31 de diciembre de 2016 en un hospital terciario privado del sur de Brasil. Se recolectaron los datos retrospectivamente en los registros médicos, incluyendo estado nutricional, indicaciones, complicaciones y evolución.

Resultados: ciento treinta y tres pacientes se sometieron a PEG en nuestra institución y fueron elegibles para el estudio. La edad mediana fue de 82 años y el 57,9% eran mujeres. Las principales indicaciones para PEG fueron demencia y accidente cerebrovascular. El 68,4% fueron diagnosticados con desnutrición grave y el 23,0% presentaron complicaciones relacionadas al procedimiento.

Conclusiones: se utilizan cada vez más tubos de PEG para nutrición enteral en pacientes disfágicos o incapaces de mantener una ingesta nutricional adecuada. Nuestros hallazgos señalan la importancia del cribado para riesgo nutricional por un equipo multidisciplinario, con atención especial al estado nutricional del paciente y a condiciones que pueden ponerlo en riesgo para disfagia y la implementación de medidas para minimizar la desnutrición.

Palabras clave:

Gastrostomía endoscópica percutánea. Nutrición enteral. Apoyo nutricional. Complicaciones.

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INTRODUCTION

Malnutrition is a common problem in hospitalized patients, being associated with increased morbidity, mortality and costs (1,2). Multiple factors contribute to a deficient nutritional status, making malnutrition the cause or consequence of severe diseases. In the hospital setting, the suboptimal prescription of oral, enteral or parenteral nutrition as well as its recognition by the care team have become a matter of concern. Critical clinical conditions predispose individuals to a variety of metabolic and immune responses, leading to lean mass loss, delayed healing, immobility, susceptibility to infections and cognitive impairment (3).

In addition to critical illness, there has been a progressive increase in the age of hospitalized patients, as well as an increase in the diagnosis of neurological diseases and their complications. In 2010, the worldwide prevalence of dementia was estimated at 35.6 million people, and this number is expected to double every 20 years. It is estimated that 4.4 million people live with dementia in the United States, and one million people in Brazil (4). Loss of appetite and dysphagia are characteristics of advanced dementia, placing these patients at increased risk of dehydration, malnutrition, and aspiration of food and liquids, thus requiring intervention (5,6).

Furthermore, besides dementia syndrome, cases of stroke are commonly reported in hospitalized patients. Despite the advances in medical therapies and rehabilitation programs, stroke remains a leading cause of disability in these patients, requiring extensive care. Dysphagia is a common consequence in stroke patients, increasing the risk of malnutrition, which is directly related to increased morbidity and mortality (7-9).

In addition to the complex debate over the terminal nature of dementia and other advanced diseases, there are moral, ethical, religious and medical issues related to the risks and benefits of alternative feeding methods in these patients. In selected cases, maintaining oral nutrition may be the option of choice for comfort care. However, for patients with longer life expectancy and at increased risk of aspiration pneumonia or other complications, enteral feeding may be an option (10-12).

Regular nutritional risk screening allows early identification of patients who are unable to meet their nutritional needs by oral intake alone, thus guiding nutritional support measures. Patients with inadequate oral intake (< 60% of the energy and protein requirements for two days) should be monitored and referred for complementary diagnosis. The interaction between members of multidisciplinary nutrition support teams has proven highly valuable in the assessment, diagnosis and prevention of complications in hospitalized patients (13,14).

Percutaneous endoscopic gastrostomy (PEG) is a minimally invasive procedure indicated for long-term administration of enteral nutrition in patients with limited ability for oral intake, who have an intact, functional gastrointestinal tract (15).

The aim of this study was to determine the profile of patients undergoing PEG in a tertiary hospital in southern Brazil.

MATERIALS AND METHODS

This was a single-center retrospective study of all patients who underwent PEG from January 1st to December 31st, 2016, at a private tertiary hospital located in Porto Alegre, southern Brazil. Data were collected retrospectively from the patients' medical records. Patients with a PEG tube who underwent the procedure during the study period for tube replacement were excluded.

The PEG technique used in all patients was the pull method described by Gauderer-Ponsky in 1980 (16). Commercially available PEG kits from different manufacturers were used. All patients received antibiotic prophylaxis with first-generation cephalosporin (cefazolin 1 g intravenously), given up to 30 minutes prior to the procedure, except when patients were already receiving broad-spectrum antibiotics for the treatment of other infections (17).

The following data were collected for analysis: length of hospital stay, subjective global assessment (SGA) of nutritional status, indication for PEG, assessment by a speech therapist prior to the indication for the PEG procedure, previous use (and duration of use if applicable) of nasoenteric feeding tubes, time to start enteral feeding after the PEG procedure, occurrence (and time to the development if applicable) of complications, and outcome (discharge or death).

Complications occurring until the outcome (discharge or death) were evaluated and classified as major (buried bumper syndrome, necrotizing fasciitis, peritonitis, bronchoaspiration, metastatic implantation at the stoma site, perforation of hollow viscera or solid organs, major bleeding, extensive or massive hematomas of the gastric or abdominal wall, gastrocutaneous fistula, and early accidental dislodgement of the PEG tube) or minor (peristomal infection, puncture site pain, extravasation of gastric contents, stoma enlargement, dermatitis, overgranulation, minor bleeding, small hematomas, temporary ileus, gastric outlet obstruction, late accidental dislodgement of the PEG tube, and persistent gastrocutaneous fistula after removal of the PEG tube), and as early (within 15 days of PEG) or late (after 15 days of PEG).

All collected data were stored in a password-protected database accessible only to the researchers in the study. Statistical analysis was performed using SPSS, version 20.0. Continuous variables were expressed as mean and standard deviation (SD) or median and interquartile range (IQR). Categorical variables were expressed as numbers and percentages. Continuous variables were compared using Student's t test or Mann-Whitney test. The Chi-square test or Fisher's exact test were used to assess potential associations between categorical variables. A p-value < 0.05 was considered as significant for all analyses.

The study was approved by the Research Ethics Committee. Informed consent was waived due to the non-interventional design of the study and retrospective nature of data collection.

RESULTS

During the study period, 133 patients underwent PEG at our institution and were eligible for inclusion in the study. Median patient age was 82 years (IQR, 76-89 years), and most participants (57.9%) were females. The main indication for PEG was dementia syndrome, followed by stroke (Table I).

A total of 91 (68.4%) patients were diagnosed as severely malnourished, i.e., were classified as SGA-C, and 39 (29.3%) were diagnosed as mildly malnourished (SGA-B).

The median time from hospital admission to the PEG procedure was <30 days both for severely malnourished patients and for mildly malnourished or well-nourished patients. Patients developed procedure-related complications in 23.0% of cases, most of which (77.0%) within 15 days of PEG. The most common complication was peristomal infection (23.0%), followed by extravasation of gastric contents (20.0%) and accidental dislodgement of the PEG tube (17.0%) (Fig. 1). Only seven patients had major complications: two cases of aspiration of gastric contents, four cases of buried bumper syndrome, and one case of necrotizing fasciitis. None of these cases resulted in death. There was no difference in the rate of complications between patients who started feeding within four hours and after four hours of the PEG procedure.

The median follow-up was 45 days (IQR, 24-104 days). There were 28 deaths, which were secondary to complications of the underlying disease. When severely malnourished (SGA-C) patients were compared with all others, there was a significant difference in mortality: 26.0% of patients classified as SGA-C died, against 9.5% of patients classified as SGA-A or SGA-B (p = 0.04) (Table I). Time from the PEG procedure to death did not differ between the groups.

DISCUSSION

PEG tubes are being increasingly used for enteral nutrition in patients with dysphagia or inability to maintain adequate nutritional intake. However, despite this perception, there is a paucity of data from the Brazilian population (18-21).

Although it is known that aging causes varying degrees of anorexia, resulting from the cumulative effects of comorbidities, medications, lifestyle changes, and social and environmental factors (23), we observed that the process of malnutrition in older patients has not been given the same attention as that given to the treatment of other organic diseases. Because not all outpatients are routinely assessed by a nutritionist and their nutritional status is a poorly explored topic in medical evaluations, there is a delay in the identification of insufficient dietary intake in most cases, which also delays the initiation of nutritional intervention. Likewise, malnutrition identified in the hospital setting is often neglected and may adversely affect the outcome of hospitalization, worsening the

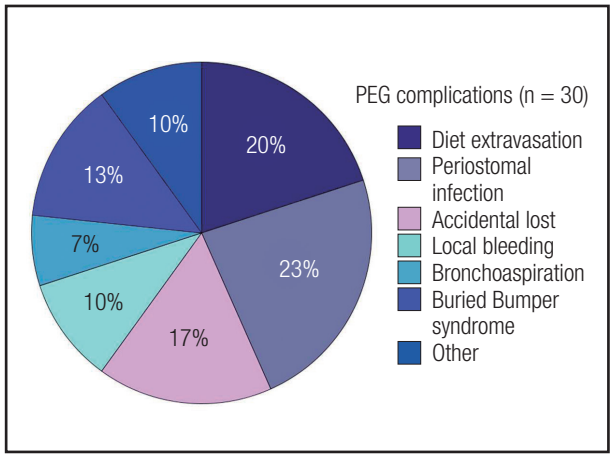

Figure 1. Complications of the use of percutaneous endoscopic gastrostomy.

Table I. Characteristics of patients who underwent percutaneous endoscopic gastrostomy

Variables	Total n = 133	Well-nourished OR Suspected of being malnourished (SGA A o B) n = 42	Severe malnourished (SGA C) n = 91	p
Age, years	82 (76-89)	82 (76-89)	82 (75-88)	0.98
Gender, male (%)	56 (42)	16 (38)	40 (44)	0.57
Main indications for percutaneous endoscopic gastrostomy (%)				0.17
Dementia	63 (47)	18 (43)	45 (49)	
Stroke	34 (26)	15 (36)	19 (21)	
Prior use of enteral tube feeding > 30 days (%)	95 (71)	32 (82)	63 (79)	0.80
Prior speech-language pathologist assessment (%)	99 (74)	36 (86)	63 (69)	0.05
Hospitalization length until procedure, days	26 (13-41)	29 (19-48)	27.5 (13-37)	0.11
Enteral feeding resumption < 4h (%)	47 (35)	20 (49)	27 (31)	0.05
Complications (%)	30 (23)	7 (17)	23 (25)	0.37
Complications < 15 days (n = 30)	23 (77)	4 (57)	19 (83)	0.31
Death (%)	28 (21)	4 (9.5)	24 (26.4)	0.04
Time, in days, between PEG and death	30 (13.2-71.7)	28.5 (14.2-105)	31.5 (13.2-71.7)	0.97

PEG: percutaneous endoscopic gastrostomy; SGA: subjective global assessment.

immune response, delaying the healing process, and increasing the risk of surgical complications (32).

In the present study, 68.4% of patients were severely malnourished before the PEG procedure, while 29.3% were mildly malnourished. In a recent systematic review of 66 studies on disease-related malnutrition in Latin America, the prevalence of malnutrition was 40-60% on hospital admission, with increases in this rate during the course of hospitalization (33). In Brazil, data from the Brazilian National Survey on Hospital Nutritional Assessment (IBRANUTRI), a large multicenter, cross-sectional study assessing the prevalence of malnutrition in hospitalized patients, show rates similar to those of worldwide studies, with 48.1% of patients diagnosed as malnourished and 12.5% as severely malnourished (36). Older adults, as well as critically ill and surgical patients, are at increased risk of malnutrition, which also increases the costs of care, thus underscoring the need for early nutritional intervention and supporting the suggestion that the timing of introduction of enteral nutrition via PEG should be revisited (34,35).

In our sample, dysphagia secondary to dementia syndrome was the main indication for PEG, accounting for 47% of cases, followed by stroke in 26% of cases. These results are similar to those reported in two other Brazilian cohorts (21,22). This is also consistent with national and international research, which identifies these two conditions as the main indications for PEG, although the representativeness of each condition may vary according to the study population (15,18-20).

Dysphagia, whether transient or persistent, is a common manifestation during the natural course of dementia and following a stroke. In both settings, it represents an important risk factor for the aggravation of malnutrition, reducing the chances of rehabilitation and survival (9). In dementia syndromes, patients show progressive difficulty in swallowing, becoming more evident in the advanced stages of the disease (12). Although international guidelines do not recommend the placement of feeding tubes for artificial administration of nutrition in patients with advanced dementia (24,25), this issue remains controversial in clinical practice. In Brazil, the family decision to place or not to place a PEG tube in the patient usually involves cultural, social and religious issues and outweighs the lack of scientific evidence of clinical benefit or improvement in survival.

The PEG tube placement is considered as a safe procedure with a low rate of complications, which are usually of low morbidity and can be easily resolved (26). The rate of minor complications varies widely in the literature, ranging from 2 to 55%, while major complications (aspiration, peritonitis, bleeding and pneumoperitoneum) occur in 5 to 25% of cases (32). In our sample, 23% of patients developed complications. Similar to international studies, peristomal infection, extravasation of gastric contents and accidental dislodgement of the PEG tube were the main complications in our sample (28).

Time to start enteral feeding after PEG tube placement is still a matter of debate among teams that perform the procedure. In our practice, opinions differ as to the best time to start PEG tube nutrition, which occurred within four hours of the procedure in only 35% of cases. Numerous studies, both in the adult and pediatric population, have demonstrated that starting enteral feeding within three to six hours of the PEG procedure is safe and associated with shorter hospital stay and lower costs of care (29-31).

Regarding mortality, none of the deaths in our sample were directly related to the PEG procedure. However, there was a higher incidence of death in severely malnourished patients (classified as SGA-C) ($p = 0.04$), which supports literature reports of a higher mortality rate (12.4% *vs* 4.7% [RR: 2.63]) in malnourished patients (37). From these data, we can speculate that the deaths in our sample were more closely related to the patient's condition prior to the PEG procedure than to the procedure itself.

CONCLUSION

The findings of the present study highlight the importance of regular nutritional risk screening by a multidisciplinary team, paying special attention to the patient's nutritional status and conditions, which may place the patient at risk of developing dysphagia, with the implementation of measures to minimize malnutrition in hospitalized patients. Further studies assessing the risks and benefits of PEG for older patients are required before an effective strategy for early nutritional intervention can be devised.

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