Nutrición Hospitalaria

Trabajo Original

Valoración nutricional

Early application of Global Subjective Evaluation Produced by the Patient and survival in patients with cancer

Aplicación precoz de la Evaluación Subjetiva Global Producida por el Paciente y supervivencia en pacientes con cáncer

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Abstract

Introduction: malnutrition is a frequent event in cancer, and unless identified early, it can lead to progressive functional impairment of the organism.

Objective: to associate the early application of the Global Subjective Evaluation Produced by the Patient (GSEPP) to the time of hospitalization and death in cancer patients.

Methods: a cross-sectional, analytical study carried out between July and September 2014 in patient records (> 20 years) with cancer, with hospitalization for more than three days in a reference cancer hospital. Age, sex, origin, disease location, antineoplastic treatment, length of stay and application of GSEPP, type of discharge, weight loss in one and six months, body mass index (BMI) and GSEPP score were collected.

Results: three hundred and sixty-six patients were evaluated: 51.6% women, 54.9% adults, 27.6% tumors of the digestive tract, 11.5% with metastasis, 21.9% of deaths and 40.4% with hospitalization time greater than or equal to ten days. The length of hospital stay was statistically lower in the early application of GSEPP (11.4 ± 1.5 *vs* 23.3 ± 1.3 days). The delay in the application of GSEPP was positively correlated with the increase in length of hospital stay, the GSEPP score, as well as malnutrition by BMI and weight loss in one and six months.

Conclusion: early application of GSEPP was associated with improvements in the parameters of malnutrition, shorter hospitalization time, but not mortality. Measures that abbreviate its application should be taken to awaken the importance and the impact of this instrument in the health of the evaluated patient.

Key words:

Cancer. Malnutrition. Nutritional assessment. Length of hospital stay.

Resumen

Introducción: la desnutrición es un acontecimiento frecuente en el cáncer. Si no se identifica precozmente puede provocar el compromiso funcional progresivo del organismo.

Objetivo: asociar la aplicación precoz de la Evaluación Subjetiva Global Producida por el Paciente (ASGPPP) al tiempo de internación y muerte en pacientes con cáncer.

Métodos: estudio transversal, analítico, realizado entre julio y septiembre de 2014 en historiales de pacientes (> 20 años) con cáncer, con ingreso superior a tres días en un hospital de referencia en cáncer. Se recogieron los siguientes datos: edad, sexo, procedencia, localización de la enfermedad, tratamiento antineoplásico, tiempo de internación y de aplicación de la ASGPPP, tipo de alta, pérdida de peso al mes y seis meses, índice de masa corporal (IMC) y puntaje de la ASGPPP.

Resultados: se evaluaron trescientos sesenta y seis pacientes: el 51,6% mujeres, el 54,9% adultos, el 27,6% con tumores del tracto digestivo, el 11,5% con metástasis, con un 21,9% de óbitos y un 40,4% de casos con tiempo de internación mayor o igual a diez días. El tiempo de ingreso fue estadísticamente menor en la aplicación precoz de la ASGPPP (11,4 ± 1.5 *vs.* 23,3 ± 1,3 días). La demora en la aplicación de la ASGPPP se correlacionó positivamente con el aumento del tiempo de internación, la puntuación de la ASGPPP, así como, la desnutrición medida mediante IMC y la pérdida de peso al mes y a los seis meses.

Conclusión: la aplicación precoz de la ASGPPP se asoció con mejoras de los parámetros de desnutrición y menor tiempo de internación, pero no con la mortalidad. Se deben tomar medidas que abrevien su aplicación para reforzar la importancia y el impacto de este instrumento en el pronóstico del paciente evaluado.

Palabras clave:

Cáncer. Desnutrición. Evaluación nutricional. Tiempo de internación.

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INTRODUCTION

Malnutrition is a frequent event in cancer. Reports of a large multicenter study on the prevalence of malnutrition in Brazil revealed a prevalence of 66.3% of malnutrition among oncological cancer patients (1). Currently, after the Brazilian Inquiry on Oncologic Nutrition (IBNO), which evaluated 4,822 cancer patients through the Global Subjective Evaluation Produced by the Patient (GSEPP) in 45 Brazilian institutions, it is noted that this scenario changed just a little, since 45.1%, are classified with some degree of malnutrition (2).

The main determinants of cancer malnutrition are reduced food intake, changes in macronutrient metabolism stimulated by the tumor and increased demand for nutrients from tumor growth (3-5). In this way, malnutrition is capable of causing functional and morphological changes, such as reduction of diaphragmatic muscle mass, modification of liver morphology and alteration of gastrointestinal functions (2).

If the situation is not reversed promptly, it is possible to install a cachexia frame, multifactorial syndrome, with continuous loss of lean mass (with or without loss of fat mass). These patients have a higher risk of morbidity associated with chemo or radiotherapeutic treatment, mortality (40%) and reduction of quality of life (2,5,6).

Early detection of malnutrition and the establishment of an adequate nutritional therapy in oncological cancer patients are essential for delaying the establishment of cachexia, improving tolerance and response to antitumor treatment and quality of life. Thus, simple and practical instruments are of extreme clinical importance in the management of these patients (7).

Therefore, the use of GSEPP, in combination with a protocol that includes both oncological and nutritional treatment, can help select the patients who will benefit from a specific and efficient intervention (3,7).

GSEPP is acknowledged as the standard method for the nutritional evaluation of the oncological patient (3), because it is sensitive and capable of identifying a greater number of patients requiring nutritional interventions, besides having low cost, good reproducibility, reliability and acceptability in practice in order to promote an earlier nutritional intervention (7,8).

The instrument should be applied even during hospitalization, within the first 48 hours, being able to serve as both an instrument for nutritional screening and nutritional assessment during hospitalization at the discretion of the hospitals nutrition service in patients aged 20 years and over (2). Therefore, we sought to associate the early application of GSEPP to the type of outcome in cancer patients hospitalized at a reference hospital.

MATERIAL AND METHODS

An analytical cross-sectional study was carried out between July and September of 2014 in the records of a reference hospital in cancer. Records of interned patients were evaluated between January 2010 and January 2014.

The research was approved by the Research Ethics Committee (CEP) of the University Hospital of the Federal University of Maranhão (HUUFMA), under the number of opinion 711.819/2014.

A sample calculation was carried out based on a population of 1,193 patients submitted to the GSEPP in the Nutrition and Dietetics Service of the hospital in the last four years, a statistical power of 95.0% was also taken into account, a sample error of 5.0% and a prevalence of malnutrition among hospitalized cancer patients of 45.1% (2), added a margin of 15.0% for losses, resulting in a minimum sample of 333 patients.

Files with a diagnosis of malignant neoplasia that had a minimum stay of three days, with at least one application of the GSEPP during the evaluation period (January 2010 to January 2014) were included. Being part of the study were: adults and elderly (age 20 years or older) (2); the choice of sex was random. Illegible or incomplete records, as well as those of pregnant women, were excluded. When the selection criteria were used, probabilistic sampling was used with all eligible records (Fig. 1).

The GSAPP provided a numerical score, resulting in different levels indicative of nutritional intervention, in which higher scores indicate greater nutritional risk. The classification of the nutritional status of the cancer patient according to this score was as follows: well nourished (< 17 points), moderately malnourished or at risk of malnutrition (≥ 17 and < 22 points) and severely malnourished (≥ 22 points) (3,7).

It is emphasized that the GSAPP is an instrument composed of seven domains. The first four are filled by the patient (changes in weight, food intake, presence of symptoms of nutritional impact and changes in functional capacity). The next three domains, which were completed by a health professional duly qualified to do so, mention the disease and its nutritional requirements, increases in metabolic rate and physical examination, as recommended by Gonzalez et al. (7) in his translation to the Brazilian version.
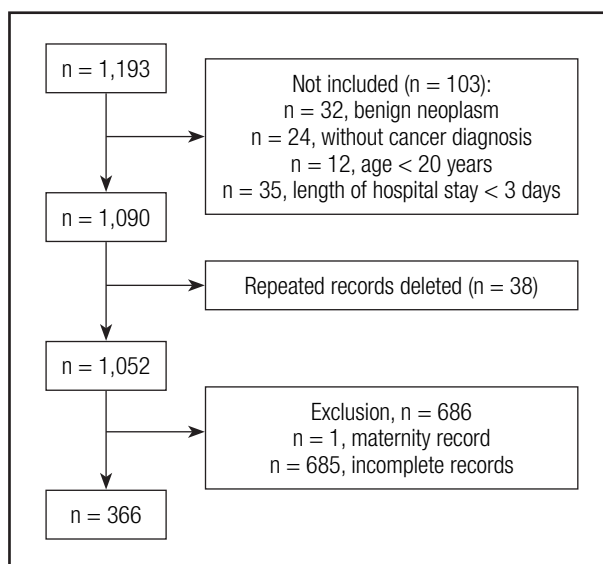

Figure 1.

Selection process.

The following data were also collected: age, sex, origin, location of the disease according to the International Code of Diseases or even in regions (especially breast, head and neck cancer), antineoplastic treatment (radiotherapy, chemotherapy, radiotherapy + chemotherapy) and overall GSEPP score, as well as the patient's outcome (discharge or death), weight loss in one and six months, BMI, and overall GSEPP score. It should be noted that the percentage of weight loss in one and six months was classified as severe when ≥ 5.0% in one month and ≥ 10.0% in six months. The BMI was classified as: malnourished when < 18.5 kg/m² for adults and < 22.0 kg/m² for the elderly; eutrophic ≥ 18.5-24.9 kg/m² for adults and ≥ 22.0-27.0 kg/m² for elderly and overweight/obese when ≥ 25.0 kg/m² for adults and ≥ 27.0 kg/m² for the elderly (9,10).

The application of the GSEPP was considered as early when < 2 days for patients with more than one GSEPP at admission; the one closest to their date of admission was considered.

The GSEPP data was tabulated in Microsoft Office Excel® spreadsheets, version 2013, (Microsoft Corporation, Redmond, United States). The analysis was performed in the statistical program Stata (12.0)® (StataCorp LP, College Station, Texas, United States). The normality of the variables was verified using the Shapiro-Wilk test.

For the evaluation of frequency associations (absolute and relative), the Chi-square test was applied. Student's t-test was applied to compare the mean days of hospitalization between patients with and without early application of GSEPP, and their corresponding Mann-Whitney for non-parametric patients. Pearson's linear correlation was applied between the time of application of GSEPP and time of hospitalization and anthropometric variables.

The data were shown in tables and all statistical associations were fixed as significant when alpha was less than 5.0%.

Table I. Characteristics of patients treated at a reference hospital in cancer. São Luís, Maranhão, Brazil, 2018

Variable	n (%)
Sex	
Female	189 (51.6)
Male	177 (48.4)
Age (years)	
20-39	51 (13.9)
40-58	150 (41.0)
≥ 59	165 (45.1)
Origin	
São Luís	176 (48.0)
State interior	166 (45.4)
Metropolitan region	24 (6.6)
Primary diagnosis of the disease	
Digestive	101 (27.6)
Female reproductive system	72 (19.7)
Male reproductive system	41 (11.2)
Respiratory	32 (8.7)
Breast	32 (8.7)
Hematopoietic	23 (6.3)
Integument	13 (3.6)
Head and neck	11 (3.0)
Urinary	10 (2.7)
Others	31 (8.5)
Presence of metastasis	
No	324 (88.5)
Yes	42 (11.5)
Total	366 (100.0)

RESULTS

A greater number of women was found (51.6%). The most prevalent age group was over 58 years old (45.1%). Patients from the city of São Luís prevailed (48.0%), as well as the tumor location in the digestive tract (27.6%) and the absence of metastasis (88.5%) (Table I).

Statistically significant associations were found (p < 0.05) between the early application of GSEPP (< 2 days) and the tumor locations in the digestive, integument systems and in the breast, and between hospitalization time (Table II).

There was a higher prevalence of early application of GSEPP (< 2 days) (73.7%). The average time of application of the instrument between the selected and non-selected was initially 1.2 ± 0.1 *vs* 12.6 ± 0.7 days, respectively (p < 0.001). BMI in adults presented a statistically higher mean (p = 0.013) among patients evaluated in up to two days (23.8 ± 0.8 *vs* 21.7 ± 0.5 kg/m²). A high frequency of eutrophic for this parameter was also observed, 74.3% for patients with GSEPP application time still on admission (p = 0.06). Among the elderly, the mean BMI (23.9 ± 0.6 kg/m²) was comparatively higher in comparison with those in the earlier selection (21.8 ± 0.4 kg/m²) (p = 0.013). It was also observed that 61.8% of the elderly with BMI were screened during the first two days of hospitalization (p = 0.018) (Table II).

There was a biased association between the late application of GSEPP (≥ 2 days) and severe weight loss in one month (35.3%, p = 0.071). Similar data were found in relation to severe weight loss at six months and late application of GSEPP (25%, p = 0.830). Comparing the average weight loss in one month between patients with and without GSEPP application in up to two days, there was greater loss among those screened at admission (8.2 ± 1.8 *vs* 7.8 ± 0.8%, respectively) (p = 0.406). Comparing weight loss in six months, there was a statistically higher loss among those who were evaluated late (14.6 ± 1.2 *vs.* 11.9 ± 2.1%, respectively) (p = 0.144) (Table II).

A prevalence of patients classified as well-nourished according to GSEPP was observed among the screened in the 48-hour period (69.7%, p = 0.055). Among the malnourished (score ≥ 17 points), a statistically significant association (p = 0.017) was observed with an expressive group of patients screened by GSEPP after the recommendation (18.9%). Comparing the average, there

Table II. Time for the application of the Global Subjective Evaluation Produced
by the Patient and nutritional status in patients of a reference hospital in cancer.
São Luís, Maranhão, Brazil, 2018

Associated variables	Total n (%)	Time of application GSEPP		Value of p
		< 2 days	≥ 2 days	
Body mass index (BMI)				
BMI adults (kg/m²)		23.8 ± 0.8	21.7 ± 0.5	0.013†
BMI adults				0.067
Malnutrition	43 (25.5)	34 (79.1)	9 (20.9)	
Eutrophic	74 (44.0)	55 (74.3)	19 (25.7)	
Over-weight/obesity	51 (30.5)	30 (58.8)	21 (41.2)	
BMI elderly (kg/m²)		23.9 ± 0.6	21.8 ± 0.4	0.013†
BMI elderly				0.018
Malnutrition	59 (45.3)	49 (84.5)	9 (15.5)	
Eutrophic	57 (43.8)	34 (61.8)	21 (38.2)	
Over-weight/obesity	14 (10.9)	8 (61.5)	5 (38.5)	
Weight loss in one month (%)		8.2 ± 1.8	7.8 ± 0.8	0.406‡
Severe weight loss in one month*				0.071
Yes	51 (45.9)	33 (64.7)	18 (35.3)	
No	60 (54.1)	48 (80.0)	12 (20.0)	
Weight loss in six months		11.9 ± 2.1	14.6 ± 1.2	0.144‡
Severe weight loss in six months				0.830
Yes	36 (42.9)	27 (75.0)	9 (25.0)	
No	48 (57.1)	35 (72.9)	13 (27.1)	
GSEPP (points)		12.1 ± 0.8	14.8 ± 0.4	< 0.001‡
Classification of GSEPP				0.055
Eutrophic	234 (63.9)	163 (69.7)	71 (30.3)	
Moderately malnourished	64 (17.5)	51 (79.7)	13 (20.3)	
Severely malnourished	68 (18.6)	56 (82.4)	12 (17.6)	
Malnutrition				0.017
Yes	132 (36.1)	107 (81.1)	25 (18.9)	
No	234 (63.9)	163 (69.7)	71 (30.3)	
Length of hospital stay (days)		11.4 ± 1.5	23.3 ± 1.4	< 0.001‡
Death				0.568
Yes	80 (21.9)	61 (76.2)	19 (23.8)	
No	286 (78.1)	209 (73.1)	77 (26.9)	
Time of application of GSEPP (days)		1.2 ± 0.1	12.6 ± 0.7	< 0.001‡
Total	366 (100.0)	270 (73.7)	96 (26.3)	

*Losses in the sample. †Mann-Whitney. ‡Student t-test.

were significantly higher scores, and indicative of malnutrition, among patients screened after two days (14.8 ± 0.4 vs 12.1 ± 0.8 points; p < 0.001) (Table II).

Evaluated screened patients still in the first hours remained on average 11.9 days less compared to those screened after this time interval (11.4 ± 1.5 vs 23.3 ± 1.4 days; p < 0.001). Among the deaths, 23.8% were screened after the recommended period (p = 0.568) (Table II).

The time interval between admission and the most frequent GSEPP application was one to ten days (67.8%) and the average time was 14.1 ± 7.4 days (Fig. 2).

Applying Pearson's linear correlation between GSEPP application time and length of hospital stay, GSEPP score, BMI (for adults and the elderly) and percentages of weight loss in one and six months, it was observed that r = 0.6719, p < 0.001 and r = 0.1061, p = 0.0424, respectively, were significantly correlated
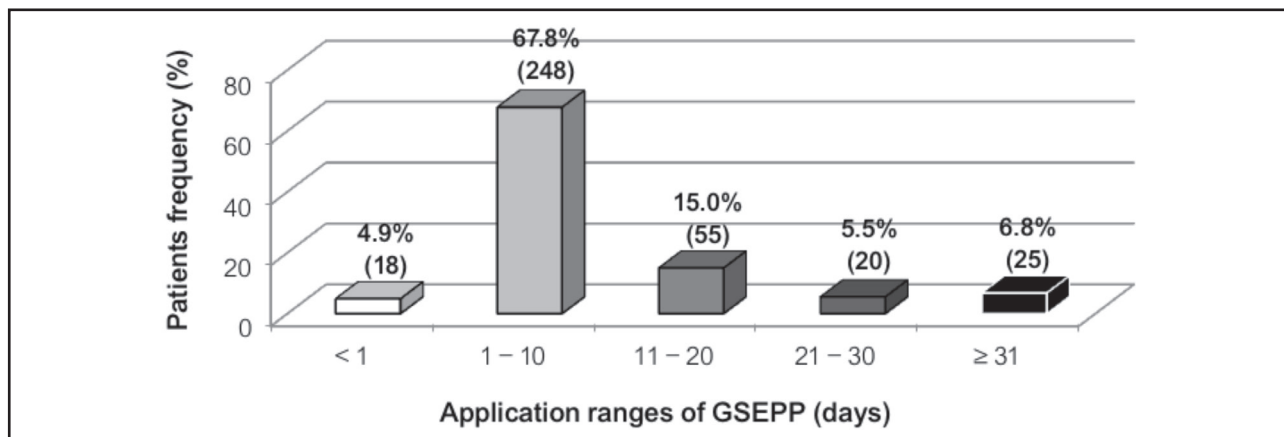
Figure 2.

Time for the application of the Produced Global Subjective Assessment of the patient in a reference hospital in cancer. São Luís, Maranhão, Brazil, 2014.

with the delay in the GSEPP application. Minor BMI values in adults ($r = -0.1216$) and in the elderly ($r = -0.8484$) were inversely correlated with the time of application of GSEPP, and were statistically significant only for the elderly ($p < 0.001$). In addition, the increase in the percentage of weight loss in one ($r = 0.0578$ and $p = 0.5470$) and in six months ($r = 0.296$ and $p = 0.0131$) also correlated positively with the delay in the application of GSEPP. There was a moderate correlation only between the increase of the time of application of the GSEPP and the length of hospital stay (Table III).

DISCUSSION

Barker, Gout and Crowe (11), in a literature review study, report that in Australia, nutritional screening after hospital admission is not mandatory, which is a cause for concern, knowing that malnutrition may remain underreported and many times poorly documented. Unidentified malnutrition does not only increases the risk of adverse complications for patients, but may potentially result in increased hospital costs. And for this reason, it is imperative that nutritional risk screening be performed using a validated tool to quickly identify patients at risk of malnutrition and thus provide data for immediate dietary interventions.

The II Brazilian Oncological Nutrition Congress defines that GSEPP is an important instrument for screening and nutritional evaluation in cancer patients (12). Its application must be performed even during hospitalization in the first 48 hours (2). However, a significant proportion of patients in this study were screened after the first 48 hours (late application), which may reflect an inadequate proportion of nutritionists to patients or lack of knowledge of the importance of using this instrument in the prognosis of hospitalized cancer patients.

Patients with late GSEPP application appear to be more exposed to malnutrition, higher rates of malnutrition and longer hospitalization periods.

Table III. Variables correlated to early nutritional screening in patients attended at a referral hospital in cancer. São Luís, Maranhão, Brazil, 2018

Variables	Pearson's linear correlation	Nutrition screening time
Length of hospital stay	R	0.6719[†]
	p-value	< 0.001
GSEPP score*	R	0.10610
	p-value	< 0.0424
Body mass index		
Adults	R	- 0.1216
	p-value	0.5470
Elderly	R	-0.2844
	p-value	< 0.001
Percentage of weight loss		
In one month	R	0.0578
	p-value	0.5470
In six months	R	0.2696
	p-value	0.0131

*Global Subjective Assessment Produced by the Patient. †Moderate correlation: $0.4 < |r| < 0.7$.

Early detection of the nutritional status of cancer patients has been a priority task in the initial health care of those evaluated, and has been associated with a higher frequency of malnutrition and length of stay. It is necessary to train health professionals from first contact with the patient, as well as to reinforce the importance of applying the instrument even in the first hours of hospitalization.

Huang et al. (13) found in their study a strong correlation between the GSEPP score and the length of hospital stay, which

corroborates the findings of this study, which also found a significant correlation between the delay in the application of GSEPP and the increase in its score, revealing that the triad (time of application - GSEPP score - hospitalization time) deserves attention in health care.

The high frequency of application of GSEPP in up to 48 hours can be attributed to the presence of clinical nutrition in the hospital environment. On the other hand, the proportion of unselected patients still in admission may be a reflection of the absence of quality indicators in nutritional therapy, of reduced inspection by organs or sectors with due autonomy, of the disproportionate number of patients per nutritionist, of the lack of concatenation of the multi-professional nutritional therapy team and the lack of knowledge of the instrument by the health professionals involved, which may make it difficult to apply the tool.

Robinson, Goldstein and Levine (14) point out that malnourished patients extend their hospitalization five days longer than well-nourished patients, which can increase hospital costs by more than 15%. In this way, the application of the tool and the admission of the tool can contribute to the reduction of hospital costs and the cases of infections and hospital complications in general. However, further work is necessary to trace the real association between these factors.

The financial value added to the early application of the instrument is negligible compared to the hospital costs of a long undue hospitalization. Thus, the GSEPP and its application in the 48 hours of admission is a practical, viable, risk predictor and inexpensive method.

Giovannelli et al. (15), in their evaluation of the impact of software designed to track readmissions of malnourished patients during previous hospitalization and to generate e-mail alerts for the nutrition service, report that automatic alert is dynamic and useful for detecting patients at nutritional risk. Strategies like these should be encouraged and used to achieve earlier nutritional screening.

This proposal may not be feasible initially to the institutional reality evaluated, since there is a need to reach fuller application of GSEPP at admission, however, it may demonstrate future perspectives of adequacy in the nutritional screening of hospitalized patients. The installation of university extension projects can contribute to better registration of information and be a more feasible reality.

Thus, it is emphasized that although the Global Subjective Nutritional Assessment (GSNA) is reliable, there is a need for adequate training of the evaluators. The creators of the classical GSNA (16) already alerted to the sensitivity of the GSNA in nutritional diagnosis when compared to other methods of nutritional assessment, provided that the examiners are well trained (1). The same should be applied to GSEPP, since it is also a subjective method of nutritional assessment.

Measures are needed to abbreviate the time of application of GSEPP as adequacy of the number of professionals per patient; the protocolization of the instrument in sectors where they are not yet being used as the emergency and oncology emergency services and outpatient services of chemo and radiotherapy; and the use of media or computerization of the application of the instrument (17), in addition to the installation of continuing education programs, which raise the importance and impact of the instrument on the health of the evaluated.

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