Nutrición Hospitalaria

Nutr Hosp. 2013;28(2):405-411
ISSN 0212-1611 • CODEN NUHOEQ
S.V.R. 318

Original

Nutritional status of patients with gastrointestinal cancer receiving care in a public hospital, 2010-2011

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Abstract

Objective: **To identify the nutritional status of patients with gastrointestinal cancer and verify its association with demographic and clinical characteristics.**

Methods: **This was a cross-sectional study with a nonprobability sampling design. The participants were 143 adult patients with gastrointestinal cancer, receiving care in the Amaral Carvalho Hospital (Jaú-SP, Brazil) from November 2010 to October 2011. A survey was conducted to collect information for the purpose of demographic and clinical characterization. In order to identify nutritional status, the Scored Pati2) test were used. The prevalence ratio (PR) was estimated. The level of significance adopted was 5%.**

Results: **The mean age of patients was 57.45 (SD = 9.62) years, with Stages III and IV of the disease being the most prevalent (39.2% and 35.0%). There was 44.8% prevalence of malnutrition. The undernourished individual more frequently reported having problems with eating (pcent-Generated Subjective Global Assessment (Scored PG-SGA) was applied. Descriptive statistics and the Chi-square (< 0.001), presented less desire to eat (p < 0.001), more nausea (p = 0.001), vomiting (p = 0.006), constipation (p < 0.001) and pain (p < 0.001) than eutrophic patients, and more frequently related feeling nauseated by the smell of food (p = 0.012), difficulty with swallowing (p = 0,002) and early satiety (p = 0.020). As regards the prevalence ratio, greater chance was observed of malnourished individuals being exposed to a larger portion of the symptoms related in the Scored PG-SGA.**

Conclusion: **High prevalence of malnutrition was observed among patients with gastrointestinal cancer, with significant association with clinical symptoms directly related to the eating process.**

(*Nutr Hosp.* 2013;28:405-411)

DOI:10.3305/nh.2013.28.2.6305

Key words: *Nutritional assessment. Gastrointestinal neoplasms. Drug therapy. Neoplasm staging.*

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Recibido: 5-XI-2012.
Aceptado: 12-XII-2012.

EL ESTADO NUTRICIONAL DE LOS PACIENTES CON CÁNCER GASTROINTESTINAL ATENDIDOS EN UN HOSPITAL PÚBLICO, 2010-2011

Resumen

Objetivo: **Identificar el estado nutricional de los pacientes con cáncer gastrointestinal y verificar su asociación con características demográficas y clínicas.**

Métodos: **Se realizó un estudio transversal, con un diseño de muestreo no probabilístico. Los participantes fueron 143 pacientes adultos con cáncer gastrointestinal, que reciben atención en el Hospital Amaral Carvalho (Jaú-SP, Brasil) entre noviembre de 2010 y octubre de 2011. Se realizó una encuesta para recoger información con el fin de caracterización demográfica y clínica. Para identificar el estado nutricional se aplico la Valoración Subjetiva Global – Generada por el Paciente Score (VSG-GP score). La razón de prevalencia (RP) fue estimada. El nivel de significancia adoptado fue de 5%.**

Resultados: **La edad media de los pacientes fue de 57,45 (DE = 9,62) años, con los estadíos III y IV de la enfermedad es la más frecuente (39,2% y 35,0%). Había 44,8% de prevalencia de la malnutrición. La persona desnutrida tenía problemas más frecuentes para comer. La estadística descriptiva y la prueba de Chi-cuadrado (< 0,001), presentaron menor deseo de comer (p < 0,001), más náuseas (p = 0,001), vómitos (p = 0,006), estreñimiento (p < 0,001) y dolor (p < 0,001) que los pacientes eutróficos y se declararon enfermos por el olor de los alimentos (p = 0,012), dificultad para tragar (p = 0,002) y la saciedad precoz (p = 0,020) com más frecuencia. En cuanto a la proporción de prevalencia, se observó una probabilidad mayor de individuos desnutridos expuestos a una porción más grande de los síntomas relacionados en la puntuación VSG-GP score.**

Conclusión: **La alta prevalencia de desnutrición se observó en pacientes con cáncer gastrointestinal, con asociación significativa con los síntomas clínicos directamente relacionados con el proceso de alimentación.**

(*Nutr Hosp.* 2013;28:405-411)

DOI:10.3305/nh.2013.28.2.6305

Palabras clave: *Evaluación nutricional. Neoplasias gastrointestinales. Quimioterapia. Estadificación de neoplasias.*

Introduction

Cancer is one of the main causes of death in the world[1] and knowing the demographic and clinical characteristics of affected individuals may be an interesting tool for understanding the individual needs and improving the quality of life of these patients.[2]

Among the clinical characteristics, the nutritional status deserves special attention, because malnutrition is commonly found in patients with cancer, and has a direct relationship with the time and response to treatment used, and the patient's prognosis.[3] Among oncological patients, those with gastrointestinal cancer present a high risk for malnutrition,[4-6] because the pathology interferes drastically in the process of digestion and absorption of foods.

Thus, with the aim of preventing or minimizing the effects of nutritional complications in these patients, clinical evaluation and follow-up are essential.[4,7-9]

Various methods have been used for nutritional assessment of patients with cancer, with emphasis on anthropometry, biochemical data, clinical and subjective evaluation.[10,11]

For assessment of the nutritional status of patients with cancer, in 1996, Ottery[12] adapted the global subjective assessment method, denominated the Patient-Generated Subjective Global Assessment (PG-SGA), which has been widely used.[13-16] This method consists of a questionnaire with closed questions, for the purpose of investigating alterations in weight, ingestion of food, gastrointestinal symptoms and functional capacity. The first part of the instrument is filled out by the patient him/herself and the second by the health professional. In 2006, this method was improved and a score was attributed each item evaluated,[17] for this reason, the questionnaire was denominated Scored PG-SGA.

Therefore, this study was conducted with the aim of identifying the nutritional status of patients with gastrointestinal cancer, receiving care in the Amaral Carvalho Hospital (Jaú-SP, Brazil) and is association with demographic and clinical characteristics.

Casuistic and methods

Study and sampling design

This was a cross-sectional study with a nonprobability sampling design.

This study was conducted in the Infirmary of the Oncology Clinic of Amaral Carvalho Hospital, Jaú-SP, Brazil, in the period from November 2010 to October 2011. The participants were 143 patients with gastrointestinal cancer, who agreed to participate and signed the Term of Free and Informed Consent.

The choice of Amaral Carvalho Hospital was based on the fact that it is a recognized institution for the treatment of cancer in Brazil.

Patients hospitalized in the intensive care unit, terminal patients or those who had members amputated were not included in the study. In addition, patients who had received a blood transfusion in the last 30 days, those who presented clinically significant bleeding (> 1 tablespoonful a day), used endovenous albumin, and those who presented uncontrolled infection were also excluded.

This study was approved by the Research Ethics Committee of the Amaral Carvalho Hospital (CEPFHAC - 170/09).

Study variables

For sample characterization, a survey was conducted to collect information with reference to age, sex, marital status, educational level, staging of the disease, and therapy used.

Age was analyzed in complete years; for marital states the categories of single, married, widowed, and separated/divorced were considered. The patient's level of schooling; complete primary schooling or incomplete secondary schooling; complete secondary schooling or incomplete high schooling; complete high schooling or incomplete higher education and complete higher education according to the proposal of the ABEP criterion - Brazil.[18]

The information with reference to clinical staging of the disease and therapy used were obtained from the patient's record charts.

The clinical staging was determined in accordance with the recommendations provided in the literature,[19,20] in which patients are grouped into the category of Stage 0 carcinoma *in situ* or pre-neoplasic lesion; Stage I with the presence of initial local invasion; Stage II limited primary tumor or minimal regional lymphatic invasion; Stage III extensive local tumor or extensive regional lymphatic invasion, and Stage IV locally advanced tumor or presence of metastasis.

With regard to therapy, the following categories were considered: chemotherapy, radiotherapy, chemotherapy and concomitant radiotherapy and clinical treatment.

The patients were submitted to nutritional status assessment within the first 24 hours after being admitted to hospital. To assess the participants' nutritional status, the Portuguese version of the Scored Patient-Generated Subjective Global Assessment (Scored PG-SGA), proposed by Gonzalez et al.[21] was used.

The individuals' nutritional status was classified according to the recommendations of Ottery12 in which they were grouped into "Stage A – well nourished", "Stage B – moderately nourished (or suspected)" and "Stage C – severerly malnourished".

Pilot study

A pilot study was conducted to verify the intraexaminer agreement on the diagnosis of the nutritional

Table I
The anthropometric measures mentioned by the patients, according to sex, obtained from the filled out Scored PG-SGA, Jaú, 2010-2011

Anthropometric measure	*Mean ± Standard Deviation*	*CI 95%**	*Minimum*	*Maximum*
Height (m)				
Male	1.70 ± 0.07	1.68-1.71	1.55	1.95
Female	1.56 ± 0.07	1.54-1.59	1.45	1.75
Weight (kg) 6 months ago				
Male	72.57 ± 17.25	69.19-75.95	43.00	128.00
Female	64.60 ± 15.34	60.01-69.19	30.00	97.00
Weight (kg) 1 month ago				
Male	67.50 ± 15.88	64.39-70.61	39.00	114.00
Female	59.85 ± 14.67	55.47-64.23	32.00	90.00
Present Weight (kg)				
Male	67.57 ± 15.86	64.46-70.68	38.80	109.00
Female	60.48 ± 14.30	56.20-64.75	31.60	88.90

*CI 95% = Confidence interval of 95%.

status made by means of the Scored PG-SGA. For this purpose, 62 patients were examined at two distinct time intervals, with an interval of one day between the assessments. The reproducibility was estimated by means of Kappa (κ) statistics and agreement classified in accordance with the proposal of Landis & Koch.[22]

Statistical analysis

Descriptive statistical analysis was performed. For the associations of interest the Chi-square (χ^2) test was used, considering the nutritional status of patients in two categories: namely, eutrophic being those classified as "well nourished" by the Scored PG-SGA and undernourished, those classified as "moderately undernourished (or suspected)" or "severely malnourished".

To verify the individual's chance of being undernourished in view of the demographic and clinical characteristics and the presence of different symptoms related by the patient, the Prevalence Ratio (PR) was estimated. A level of significance of 5% was adopted for taking a decision ($p < 0.05$).

Results

The mean age of participants was 57.45 (DP = 9.62) years, with a minimum of 27 and maximum of 81 years, with 76.2% of the patients being of an age equal to or older than 50 years. Of the participants, 69.9% were of the male sex, 69.2% were married, 11.9% divorced, 9.8% widowed and 9.1% single. The educational level of 77.6% of the patients was below complete high schooling.

With respect to clinical characteristics, only 2 (1.4%) of the participants presented Stage I of the disease, 28 (19.6%) Stage II, 56 (39.2%) Stage III and 50 (35.0%) Stage IV. It should be explained that the patient charts of 7 (4.9%) patients contained no information about the staging of the disease, because the pathology had only recently been diagnosed or it was excessively advanced.

At the time of the study 119 (83.2%) patients were undergoing chemotherapy treatment, 20 (14.0%) chemotherapy and concomitant radiotherapy and 4 (2.8%) were only under clinical treatment.

The anthropometric measures mentioned by the patients, according to sex, obtained from the filled out Scored PG-SGA, are presented in table I.

According to the patients' reports, it may be noted that for both the male and female sex, there was no change in body weight during the previous 6 months, which may be verified due to superimposition of the 95% Confidence Intervals.

Intraexaminer agreement on diagnosis of the nutritional status was considered good ($\kappa = 0.78$, $p = 0.001$).

Of the patients 79 (55.2%) were classified as well nourished (Stage A), 46 (32.2%); moderately undernourished (Stage B) and 18 (12.6%) severely undernourished (Stage C).

Table II presents the study of the association between the nutritional status of the patients evaluated and their demographic and clinical characteristics.

With regard to the demographic and clinical characteristics, significant association was verified only between the nutritional status and educational level.

The nutritional status of patients according to the symptoms reported in the Scored PG-SGA are presented in table III.

The individuals exposed to some of the symptoms related in the Scored PG-SGA presented greater chance (PR) of being classified as undernourished.

The undernourished patients more frequently reported having problems with feeding themselves, presented less desire to eat, more nauseas, vomiting,

Table II
Distribution of patients according to the nutritional status and demographic and clinical characteristics, Jaú, 2010-2011

Characteristics	Nutritional Status		Total	χ^2	p	PR
	Undernourished	Eutrophic				
Demographic						
Sex						
Male	45	55	100			
Female	19	24	43	0.008	0.928	1.033
Marital Status						
Single	8	5	13			
Married	44	55	99			
Widowed	8	6	14			
Divorced	4	13	17	5.452	0.142	–
Educational Level						
Up to incompletesecondary schooling	55	56	111			
Higher thancompletesecondary schooling	9	23	32	4.611	0.032*	2.510
Clinical Characteristics						
Stage of Disease						
Stage I and II	12	18	30			
Stage III and IV	51	55	106	0.619	0.431	0.719
Type of Treatment						
Chemotherapy	57	62	119			
Chemotherapy and Radiotherapy	5	15	20			
Clinical Treatment	2	2	4	3.677	0.159	–

*Statistically significant difference for $\alpha = 0.05$.

constipation and pain than the eutrophic patients. In addition, the undernourished patients reported feeling nauseated by the smell of food, having difficulty with swallowing and early satiety more frequently than did the eutrophic patients.

Discussion

Over the last few decades, there has been significant increase in the incidence of cancer, and it has evidently become a global public health problem.[23] Thus, it is of fundamental importance to define its diagnosis and stage in order to select the most suitable therapeutic procedures[24] and predict complications that may influence the clinical and nutritional conditions of oncological patients. Therefore, one understands the utmost importance of identifying the demographic and clinical characteristics of those affected by cancer as soon as the disease is detected and/or the patient is admitted to hospital, so that these patients may serve as a reference for establishing priorities of actions, whether preventive or curative, with the purpose of improving the quality of life of patients.

Among the demographic characteristics, it was observed that 76.9% of the patients were of an age equal to or older than 50 years. According to the American Cancer Society,[25] over 90% of the patients with gastrointestinal cancers, especially of the colon and rectum, are diagnosed in individuals at an adult age. The guidelines suggest the need for performing tracing tests in individuals as from the age of 50 years with the intention of identifying and removing pre-cancerous polyps.

Von Meyenfeldt[4] warns that gastrointestinal neoplasms are directly related to nutritional harm, as they cause mechanical and functional alterations in the organs of this system, which is intimately connected with the process of feeding and nutrition, and therefore merits special attention. In addition, Van Cutsem and Arends[7] have pointed out that chemotherapy results in important side effects, such as anorexia, nausea, vomiting, alteration in taste and diarrhea, which may compromise the nutritional status of patients receiving this treatment to an even greater extent.

Therefore, in order to prevent or minimize the deficient nutritional status of patients, it is necessary to make an early and routine nutritional assessment. According to the literature,[14,26-28] multiple clinical parameters are available for assessing the nutritional status of patients. Nevertheless, no standard recommendation has been made, because each method has advantages and disadvantages. This is why a tool or combination of methods must be chosen, taking into consideration the physiological, nutritional and clinical characteristics of the patients evaluated.[29]

The option to use the Scored PG-SGA in this study was centered on the fact that this was a simple, fast and low cost method of evaluation that could be used by different categories of professionals and in a hospital environment. It should be pointed out that in this study, when intraexaminer calibration was performed as regards the use of the Scored PG-SGA, the main concern was to obtain reliable information.

Table III
Distribution of the patients according to the nutritional status and symptoms related in the Scored PG-SGA, Jaú, 2010-2011

Characteristics	Nutritional Status		Total	χ^2	p	PR
	Undernourished	Eutrophic				
I have no problemwith feeding myself						
Yes	7	30	37			
No	57	49	106	13,476	< 0,001*	0,200
No appetite, only don't feel like eating						
Yes	25	5	30			
No	39	74	113	22.852	< 0.001*	9.487
Nausea						
Yes	15	4	19			
No	49	75	124	10.361	0.001*	5.740
Vomiting						
Yes	8	1	9			
No	56	78	134	7.566	0.006*	11.143
Constipation						
Yes	22	9	31			
No	42	70	112	10.999	< 0.001*	4.074
Diarrhea						
Yes	4	1	5			
No	60	78	138	2.603	0.107	5.200
Sores in the mouth						
Yes	9	5	14			
No	55	74	129	2.394	0.122	2.422
Dry mouth						
Yes	17	13	30			
No	47	66	113	2.179	0.140	1.836
Pain						
Yes	40	21	61			
No	24	58	82	18.647	< 0.001*	4.603
The food has a strange taste or is tasteless						
Yes	6	4	10			
No	58	75	133	1.011	0.315	1.940
The smell makes me feel sick						
Yes	7	1	8			
No	57	78	135	6.262	0.012*	9.579
Problems with swallowing						
Yes	26	14	40			
No	38	65	103	9.206	0.002*	3.177
I quickly feel satisfied						
Yes	8	2	10			
No	56	77	133	5.402	0.020*	5.500
Tiredness (fatigue)						
Yes	24	18	42			
No	40	61	101	3.691	0.055	2.033
Total	64	79				

*Statistically significant difference for $\alpha = 0.05$.

In table I it may be noted that there was no significant alteration in weight among the patients assessed, which suggests the patients' nutritional status was maintained. According to Barbosa-Silva[29] malnutrition is a continuous imbalance that precedes metabolic and functional alterations in the initial stages, and only afterwards causes anthropometric damage. Therefore, it suggests the need to use methods that integrate various criteria in order to identify malnutrition correctly.

From the ASG-PPP score, it could be observed that 44% of the patients presented with some degree of malnutrition, which may be related to the side effects of antineoplastic treatment and/or the difficulty of eating as a result of this treatment or the disease. In table III significant association was noted between

the nutritional status and clinical symptoms directly related to eating, with more severe compromise of undernourished patients. Although the treatment itself was not shown to be associated with the nutritional deficiency, the significant relationship existent between the symptoms mentioned by the patients and the side effects of the treatment should be emphasized. Grant & Byron[30] and Makhija & Baker[11] described the most common side effects of chemotherapy treatment as being anorexia, nausea, vomiting, alterations in bowel habits, mucositis and esophagitis, and indicated that these may influence the nutritional status of patients. In the studies of Stratton et al. appud Von Meyenfeldt[4] and Ryu & Kim[5] the prevalence of malnutrition was higher than 30.0%, and could reach 65.0 to 85.0% of patients with cancer of the stomach.[4,5]

Table II shows that significant association was found only between the nutritional status and the educational variable, since these patients had greater chance of being undernourished. However, the study of Leufkens et al.[31] pointed out that patients with a high educational level had healthier habits of living, making it evident that knowledge could lead to preventive attitudes.

In view of the results presented, it is understood that the professional nutritionist must be qualified to elaborate prophylactic or therapeutic strategies with the purpose of maintaining the oncological patient's nutritional within adequate clinical levels. Thus, it is necessary to monitor each patient's condition.

Among the dietary strategies to be adopted, nutritional education is suggested, offering the patient options to adapt his/her menu with a view to increasing the calorie and protein intake. In addition, the prescription of dietary supplements is recommended, and when necessary, more drastic interventions are performed, which generally occurs when the patient receives enteral nutrition, as this is a preferred way of feeding rather than parenteral feeding, because there are fewer risks of infectious complications with enteral feeding.[4] This process should involve both the patient and his/her family members.

This suggests that it appears to be crucial to minimize these symptoms in order to improve the feeding process, and consequently, the nutritional status of individuals. This is an important challenge to professionals in the field of oncology, because its scope goes beyond the different medical specialties and resides in the unique need to invest in less aggressive treatments that are able to preserve the quality of life of patients.

Conclusion

High prevalence of malnutrition was observed among patients with gastrointestinal cancer, and this was significantly associated with clinical symptoms directly related to the eating process.

Acknowledgements

The Authors thank CAPES (Personal Improvement Coordination for Higher Education) for granting the scholarship. They also thank Amaral Carvalho Hospital for the authorization to conduct this study, and the professionals and patients for their cooperation.

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