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Nutritional screening through patient-generated subjective global assessment (PG-SGA) in gynecological cancer

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Abstract

Cancer is considered an important cause of morbidity and mortality, and is related to the impairment of nutritional status, which in turn directly affects clinical management and quality-of-life. In this context, we sought to identify the nutritional status of women with gynecological cancer and to investigate the association of nutritional status by specific screening with nutritional status according to body mass index (BMI), age group, and clinical characteristics through a cross-sectional study, carried out in the gynecology and oncology wards of a university hospital, from July to December 2017. Patients aged ≥ 20 years old, diagnosed with gynecological cancer were evaluated. Nutritional status was identified using the patient-generated subjective global assessment (PG-SGA), which classifies well nourished, moderately malnourished, or severely malnourished individuals. Current height and weight were obtained using a mechanical scale and the usual weight was reported by the patients, which were used to determine the BMI and the percentage of weight lost. Sixty women were studied, with a mean age of 54.5 ± 14.17 years old, with a predominant diagnosis of uterine cancer (68.3%). Stage IV was the most prevalent (65%), the frequency of malnutrition was high (68.3%), especially among the elderly (81.5%), weight loss occurred in 60% of the group, and there was a need for intervention in 91.7% of cases. In this sample of adult and elderly women, a high frequency of malnutrition through the PG-SGA was identified. These findings highlight the importance of this tool in the identification of nutritional status in patients with gynecological cancer.

keywords: Nutritional Assessment. Nutritional status. Malnutrition. Neoplasms. Gynecology.

INTRODUCTION

Cancer is a set of diseases characterized by disordered cell growth, which has shown an increase in incidence and mortality over the years[1]. According to the National Cancer Institute (INCA)[2], approximately 625 thousand new cases are expected for each year of the triennium 2020 – 2022; of these, 23,130 cases are of uterine origin and 6,650 are of ovarian origin.

In women, cancer stands out for its high frequency, with gynecological tumors being important causes of morbidity and mortality and worsening of quality-of-life, which makes detection in the early stages and adequate management according to clinical staging essential[3-5]. Among the main gynecological cancers is ovarian cancer, which is considered to have the worst prognosis with high lethality. Furthermore, cervical cancer caused by persistent infection of human papillomavirus

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(HPV) subtypes, in addition to high frequency, has a high rate of mortality in the female population[6,2].

Metabolic changes such as reduced appetite and food intake, increased nutritional demand, and weight loss are constantly caused by the tumor and/or the side effects of the treatment, which can lead to impaired physical, immunological, and nutritional status[7]. Therefore, malnutrition is seen as a frequent complication in cancer patients and is related to changes in the immune response and increased risk of infections[8].

The Brazilian Oncological Nutrition Survey (BONS), a national multicenter study carried out in 2012, identified that of the 584 patients with gynecological tumors, 48% had some degree of malnutrition[9]. Meanwhile research carried out by Zorlini, Cairo, and Gurgel[10] observed, in the sample of women with gynecological cancer, a total percentage of malnutrition of 24%, and was even higher in those with ovarian tumors (28.6%). Another finding was that 40% reported weight loss after diagnosis and 33% had altered physical capacity.

These results demonstrate the need to assess the nutritional status through the use of quick, easy-to-apply and low-cost methods, in the search to identify nutritional risks or malnutrition and, thus, intervene early with adequate nutritional therapy[11,12].

The Patient-Generated Subjective Global Assessment (PG-SGA) is a screening method created by Ottery[13] after a specific adaptation of the SGA for the cancer population, which was translated and validated in Brazil in 2010. It consists of an essentially clinical method, specific for cancer, which allows for a quick assessment of nutritional status, identification of symptoms of nutritional impact, functional capacity, and weight loss, and is considered the gold standard in evaluations due to its high sensitivity and specificity[14,15].

Several studies have been published using PG-SGA and cancer, however few have specifically included patients with gynecological tumors and their nutritional repercussions. In view of this perspective, the present study aimed to identify the nutritional status of patients with gynecological cancer through specific nutritional screening using PG-SGA and, secondarily, to investigate the association of nutritional status by PG-SGA with nutritional status according to BMI, age group, and clinical characteristics of the patients.

METHODOLOGY

This is a descriptive cross-sectional study, carried out from July to December 2017, in which women with malignant cervical (ICD10 - C53) and ovarian (ICD10 - C56) neoplasms admitted to the gynecology and oncology sectors at the Hospital das Clínicas of the Federal University of Pernambuco (HC-UFPE) were evaluated.

Patients aged 20 years or older, who were in different stages of the disease and undergoing any type of treatment, were included in the study. Those unable to answer the questionnaire and those with no companion (n=1), in addition to those with associated clinical and surgical diagnoses, which could interfere with nutritional screening, such as kidney or liver diseases or previous major surgeries were excluded (n=3) (Figure 1).

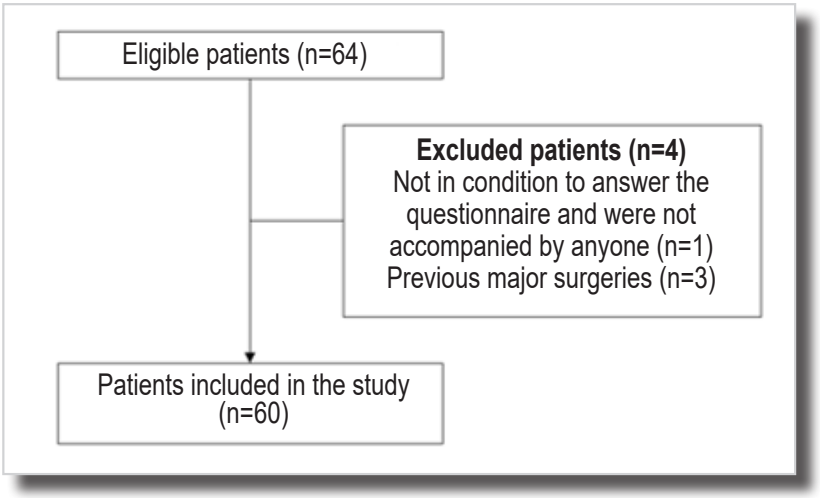

Figure 1 – Flowchart of inclusion and exclusion of study patients.

The research was carried out after approval by the Research Ethics Committee of the Federal University of Pernambuco (CEP/UFPE), under opinion No. 69505817.1.0000.5208, in compliance with Resolution 466/12 on "Research Involving Human Beings", of the Health Council of the Ministry of Health.

Data collection was performed within a maximum of 48 hours after admission, after signing the Informed Consent Form (ICF). Data regarding age, diagnosis, and other information were obtained from the medical records, while nutritional assessment was evaluated using the translated and validated Brazilian version of the PG-SGA screening instrument made by Gonzalez *et al.*[14].

This instrument assesses information on recent changes in weight, changes in food intake, gastrointestinal symptoms, functional capacity, metabolic stress, and physical examination. The sum of the points and scores of these variables allows for the classification of the nutritional status of cancer patients in categories A (well-nourished or anabolic), B (moderate malnutrition or suspected malnutrition), or C (severely malnourished) considering the presence and severity of the symptoms presented[14].

For anthropometric data, current weight, and height, a Filizola® mechanical scale was used, with a capacity of 150 kg and precision of 100g. The weighing was performed with the individual barefoot and wearing light clothes. Height was measured with a stadiometer of the scale itself, with a capacity of 2m and accuracy of 0.5cm. The usual weight was reported by the patients. Data were used to determine BMI (weight (kg)/ height (m^2)) which was classified according to the World Health Organization (WHO) recommendation for adults, considering <18.5 kg/m^2 malnourished, 18.5 – 24.9 kg/m^2 eutrophic, 25.0 – 29.9 kg/m^2 overweight, and > 30.0 kg/m^2 obese. For elderly women (>60 years old) the classification proposed by the Organización Panamericana de la Salud was used, where < 23 kg/m^2 underweight, >23 - < 28 kg/m^2 normal weight, ≥ 28 - < 30 kg/m^2 pre-obese, and ≥ 30 kg/m^2 obese[16,17].

For statistical analysis, the data were analyzed descriptively and inferentially. The descriptive statistics techniques used were absolute frequencies and percentages for categorical variables. The inferential statistics techniques used were Pearson's chi-squared hypothesis test to verify the difference/ association of the proportions of the categories, and Fisher's exact test when the

condition for using the chi-squared test was not verified.

The margin of error used in the decision of the statistical tests was 5% and the confidence intervals obtained were at 95%. The data were entered into an EXCEL spreadsheet and the program used to obtain the statistical calculations was IBM & SPSS version 23.

RESULTS

Sixty women with gynecological cancer were evaluated, with a mean age of 54.5±14.17 years old and was predominantly of the age group from 20 to 59 years old (55%). The majority (68.3%) were diagnosed with uterine cancer, in stage IV (65%), with limitations of motor activity (81.7%), presenting mainly nutritional impacts as symptoms: inappetence, xerostomia, nausea, and constipation (Table 1).

As shown in table 1, symptoms and motor activity when related to nutritional status obtained a statistical association, with a higher percentage of malnutrition according to the PG-SGA classification in patients with compromised functional capacity (75.5%) as well as those who had as main symptoms inappetence (91.9%), vomiting (91.3%), and nausea (87.9%).

Table 2 shows, in general, a high frequency of malnutrition (68.3%) and the need for nutritional intervention (91.7%) in the population studied.

Approximately 60% of the population studied had weight loss, which was considered severe in at least 20% of the cases. Regarding nutritional status, the frequency of malnutrition (68.3%) was more significant through the PG-SGA classification than by BMI (10%). When comparing the assessments according to age group, 81.5% of the elderly and 57.6% of the adults were considered malnourished by the PG-SGA (showing a statistical association), while by the BMI the percentage was 18.5% and 3%, respectively (table 3).

Table 1 – Clinical characteristics of women with gynecological cancer according to nutritional status based on the PG-SGA classification. HC/UFPE, Recife, PE, 2017.

Variable	PG-SGA						P value
	Group Total		Malnourished (Class B and C)		Eutrophic (class A)		
	N	%	n	%	n	%	
Age range:							**0.048*** (1)
Adults	33	55.0	19	57.6	14	42.4	
Elderly	27	45.0	22	81.5	5	18.5	
Tumor location							**0.544** (1)
Uterus	41	68.3	27	65.9	14	34.1	
Ovary	19	31.7	14	73.7	5	26.3	
Impact symptomatology							
No apetite	37	61.7	34	91.9	3	8.1	< 0.001* (1)
Xerostomia	35	58.3	26	74.3	9	25.7	0.241 (1)
Nausea	33	55.0	29	87.9	4	12.1	< 0.001* (1)
Cold	33	55.0	25	75.8	8	24.2	0.172 (1)

to be continued...

...continuation - Table 1

Variable	PG-SGA						P value
	Group total		Malnourished (Class B and C)		Eutrophic (class A)		
	N	%	n	%	n	%	
Early satiety	28	46.7	23	82.1	5	17.9	0,031* (1)
Dysgeusia	25	41.7	20	80.0	5	20.0	0,101 (1)
Vomiting	23	38.3	21	91.3	2	8.7	0,003* (1)
Diarrhea	9	15.0	7	77.8	2	22.2	0,705 (2)
Mucositis	8	13.3	3	37.5	5	62.5	0,095 (2)
Motor activity							0,027* (2)
Has limitations	49	81.6	37	75.5	12	24.5	
No limitations	11	18.4	4	36.4	7	63.6	

Legend: (1) Pearson's Chi-squared test. (2) Fisher's Exact test. PG-SGA= patient-generated subjective global assessment.

Table 2 – Nutritional status classified using the PG-SGA and need for nutritional intervention in women with gynecologic cancer. HC/UFPE, Recife, PE, 2017.

Variables	n	%
Nutritional status		
Well nourished	19	31.7
Moderately malnourished or nutritional risk	33	55.0
Severe malnutrition	8	13.3
Global assessment classification based on nutritional status		
Malnutrition (Class B + Class C by PG-SGA)	41	68.3
Eutrophic (Class A by PG-SGA)	19	31.7
Nutritional intervention		
No intervention needed	1	1.7
Nutritional education	4	6.7
Nutritional intervention	9	15.0
Critical need for nutritional intervention	46	76.7

Caption: PG-SGA= patient-generated global subjective assessment.

Table 3 – Assessment of the weight loss percentage (WLP) and classification of nutritional status by PG-SGA and BMI according to age group of women with gynecological cancer. HC/UFPE, Recife, PE, 2017.

Variable	Age group						P value
	Group total		Elderly		Adults		
	N	%	n	%	n	%	
TOTAL	**60**	**100.0**	**27**	**100.0**	**33**	**100.0**	
WLP (1 to 6 months):							**p(1) = 0.685**
0% to 1.9%	24	40.0	9	33.3	15	45.5	
2% to 2.9%	7	11.7	3	11.1	4	12.1	

to be continued...

...continuation - Table 3

Variável	Age group						P value
	Group total		Elderly		Adults		
	N	%	n	%	n	%	
3% to 4.9%	9	15.0	6	22.2	3	9.1	
5% to 9.9%	8	13.3	4	14.8	4	12.1	
10% or more	12	20.0	5	18.5	7	21.2	
PG-SGA classification according to nutritional status							
Eutrophic (Class A)	19	31.7	5	18.5	14	42.4	$p^{(1)} = 0.048$ *
Malnourished (Class B + Class C	41	68.3	22	81.5	19	57.6	
BMI Rating							$p^{(1)} = 0.114$
Malnourished	6	10.0	5	18.5	1	3.0	
Normal	25	41.7	11	40.7	14	42.4	
Overweight	13	21.7	3	11.1	10	30.3	
Obese	16	26.7	8	29.6	8	24.2	

Caption: (1) Fisher's Exact test. WLP= weight loss percentage. PG-SGA= patient-generated subjective global assessment. BMI= body mass index.

DISCUSSION

Studies using the PG-SGA in samples of women with gynecological cancer are scarce, which highlights the importance of the present study in which 91.7% of the population examined required nutritional intervention due to the significant percentage of malnutrition and symptoms identified by screening; further highlighting the importance of applying this method.

In Brazil, the Cancer Nutritional Survey carried out by INCA used the PG-SGA methodology, in a cohort with 45 institutions. They identified 146 women with gynecological tumors at a mean age of 55.3 years old, with a high prevalence of moderate or severe malnutrition (62.4%); data similar to those found in the present study. Regarding the presence of malnutrition according to tumor location, women with ovarian cancer also presented a higher degree of nutritional alteration (PG-SGA; B and C), when compared to other tumors[18].

A study carried out in India by Das *et al.*[19] with 60 women with gynecological cancer, at stages I and III, predominantly, detected a higher prevalence of malnutrition in ovarian tumor patients and a high percentage (48.3%) of moderate malnutrition (PG-SGA; B) corroborating the findings of the present sample. However, they identified 40% with severe malnutrition (PG-SGA; C), values much higher than those found herein (13.3%). When the authors compared the subjective (PG-SGA) and objective (BMI) screening methods, a higher percentage (88.3%) of malnutrition was also observed by PG-SGA than by BMI (26.6%). On the other hand, the values of excess weight by BMI were 31.67%, a lower incidence than herein (48.4%).

In a study carried out in a hospital in the Northeast of Brazil with women hospitalized for gynecological cancer undergoing surgical treatment, only 4.9% of the adults and 23.3% of the elderly women were malnourished according to BMI, which coincides with our results[20]. These data reveal that, despite this being a nutritional indicator widely used in clinical practice, its isolated use is

not recommended to assess malnutrition in oncology, since it cannot accurately differentiate the components of body weight, which may mask the loss of lean mass in people with a BMI within the healthy range or overweight[21,22]. This makes it important to use other assessment methods such as the PG-SGA, which is mor sensitive in cancer patients[23,24].

Santos *et al.*[25], when evaluating 366 patients with cancer, observed in a sample of 32 women with gynecological cancer, a percentage of malnutrition of around 44% using the PG-SGA. Meanwhile the Thai version of this tool identified that 76% of patients with gynecological tumors were malnourished[26]. In another study carried out in Thailand with 97 women with early-stage gynecological cancer and a mean age of 54 years old, the percentage of moderate to severe malnutrition was 53.6%, and was even higher in patients with ovarian cancer (79.3%). This corroborates our results, where 73.7% of women with ovarian tumor were malnourished[27].

According to Balogun *et al.*[28], because ovarian cancer is difficult to diagnose, it has a relevant impact on the nutritional status of women affected by the disease. The location of the tumor is considered a limiting factor for early diagnosis, contributing to unfavorable nutritional outcomes, such as inappetence (due to constant and/or rapid sensation of fullness, nausea, and vomiting), intestinal obstruction (a recurrent problem in ovarian cancer) and, often, diarrhea, justifying our findings.

Regarding weight variation, Schiessel *et al.*[29], in a study carried out in Brazil with different cancer patients, observed that only 9.6% of patients with gynecological cancer showed weight loss. This is contrary to our results and to those found by the IBNO in which the percentage of unintentional weight loss was over 40%, with the majority (68.3%) reporting reduced food intake due to symptoms resulting from the oncological disease[9].

Regarding the use of the PG-SGA to assess the symptoms of nutritional impact, a multicenter study carried out in Brazil with patients with different types of cancer, identified in a group of 580 women with gynecological tumors inappetence (35%), nausea (30.5%), and xerostomia (24.7%) as the most prevalent symptoms, corroborated herein with an even higher frequency[30].

Furthermore, Wiegert, Padilha, Peres[31] evaluated 120 hospitalized patients with different types of tumors and found possible results for comparison with this study; with regard to xerostomia, the results were similar (60% versus 58.5%). In the presence of anorexia, constipation, nausea, vomiting, and early satiety, lower frequencies were found than herein, despite being patients undergoing palliative care, who could have a higher prevalence of these symptoms[31,32].

Regarding functional capacity, Gomes and Maio[33] found data similar to ours, where only 16.67% of the patients were able to carry out their activities without limitations, with the majority having reduced functional capacity, staying in bed for almost half the day. Fatigue associated with cancer is a factor that reduces daily functional capacity, affecting approximately 72% to 95% of all cancer patients[34].

The present study recognizes as limitations: the sample selected in a non-probabilistic way for convenience (whose detailed description of the patients' choice is presented in figure 1); the absence of data with analysis of the classification of the PG-SGA according to the staging of the tumor and the lack of measurements that evaluated their lean mass. However, it is worth bearing in mind the

scarcity of literature on PG-SGA in patients with gynecological cancer; thus, it is recommended that further studies be carried out, with a larger sample size, applying the PG-SGA in hospitalized women with gynecological cancer, with the aim of expanding the scientific literature on the subject, and thus contributing to the validation of the instrument in this specific population.

CONCLUSION

In this sample of adult and elderly women with gynecological cancer, a high frequency of malnutrition was identified through PG-SGA nutritional screening. The association of PG-SGA with BMI was reduced in the total group and by age group; low malnutrition was detected by BMI in the entire sample and in the elderly. There was also an association between PG-SGA and clinical characteristics, tumor location, symptoms of nutritional impact, and motor activity, with malnourished patients showing greater disease severity and worse quality of life. Knowledge about nutritional status can directly influence the care and attention given to this population. Therefore, these findings support the importance of using the method in clinical practice and show the need for more studies focused on the subject.

Author statement CRediT

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All authors have read and agreed to the published version of the manuscript.

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