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Clinical-Nutritional Characterization Of Patients With Lung Cancer. Saturnino Lora Hospital

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ABSTRACT

Introduction: The need to implement new variables such as nutritional status in the comprehensive evaluation of patients with lung cancer for better treatment results is essential. In our context, there is insufficient evidence of the value of indicators of the nutritional status of these patients.

Aim: Characterize clinical markers and nutritional status in patients with lung cancer.

Material and method: An observational, descriptive, and cross-sectional study was carried out in a sample of 61 patients with lung cancer who attended the Clinical Trial consultation at the Saturnio Lora Provincial Hospital in Santiago de Cuba, between December 2015 and March 2016, where the condition was evaluated. Nutrition based on arm body composition and body mass index.

Results: Women represented 47.5% and men 52.5% in total. There is a higher incidence in women between 61 and 70 years old and in men 51 and 60 years old and between 71 and 80. Concerning the muscle area, fat area, and triceps fold in the last stages of the disease there is marked evidence of depletion. This contradicts the Body Mass Index (BMI), which appears normal in the different stages.

Conclusions: There was a slight predominance of men over women. The triceps fold, muscle area and fat area showed more correspondence in the nutritional evaluation of the most advanced stages of lung neoplasia concerning body mass index

Keywords: lung cancer, nutritional evaluation, clinical stage, arm composition. ..

1. INTRODUCTION

Malnutrition is a common problem in cancer patients, with a prevalence of 15-20% at the time of tumor diagnosis and up to 80-90% in cases of advanced disease. Its maximum expression is tumor cachexia, which affects 15-40% of patients, 60-80% if we refer exclusively to those with advanced disease. It is estimated that around 20% of patients die from complications of malnutrition rather than from the disease itself (Zhang, Jin et al. 2024).

Malnutrition contributes to increasing morbidity and mortality in these patients, regardless of type and stage, being a poor prognostic factor for both survival and survival. as for the response to treatment. Nutritional deficiency is related to

immunological and clinical deterioration (Yue, Qin et al. 2024).

The causes that can produce nutritional alterations in these patients are multiple. Among the most representative are the patient's mood, the toxicity of the treatments, and those derived from the tumor itself, which can lead to a decrease in intake, an increase in needs, a decrease in the absorption of nutrients, or an increase in losses. It is the most common secondary diagnosis in cancer patients (Kim, Kim, et al. 2024).

The location and extension of the tumor are directly involved in the appearance of nutritional deterioration. The causes of malnutrition are classified as causes related to the tumor itself, to the patient, or oncological treatments. We differentiate four main mechanisms by which malnutrition can appear in cancer patients: low energy and nutrient intake, alterations in digestion and/or absorption of nutrients, increased needs, and alterations in nutrient metabolism (Shakhshir, Salameh, et al. 2024).

The consequences of malnutrition on the prognosis of cancer patients are manifested at both a functional and structural level, impacting clinical evolution, therapeutic compliance, and the psychosocial sphere. The effectiveness of chemotherapy and radiotherapy is reduced, the risk of toxicity from them increases, muscle mass and functional capacity decrease, the risk of postoperative complications increases, the hospital stay is prolonged and quality of life worsens; which implies, in turn, a higher economic cost. Furthermore, weight loss is associated with decreased survival (Yang, Huang, et al. 2024).

Tumor cachexia is directly or indirectly responsible for the death of a third of cancer patients and predicts a poor response to oncological treatment. In this case, the patient presents decreased appetite, weight loss, metabolic alterations, and an inflammatory state, associated with some underlying disease, the tumor. In the

particular case of cachexia associated with cancer, a recent international consensus proposes the following (Li, Xu et al. 2024)

diagnostic criteria: weight loss greater than 5% in the last 6 months (not explained solely by anorexia); or a BMI < 20 kg/m2 and any degree of weight loss greater than 2%; or an appendicular skeletal muscle index consistent with sarcopenia (men < 7.26 kg/m2 and women < 5.45 kg/m) and any weight reduction > 2%. Nutritional alterations, mainly nutritional deficiencies generally reflected in hypoalbuminemia (Wang, Han et al. 2024),

may pose an increased risk of complications and mortality in any of the current modalities of lung cancer treatment. The assessment of nutritional status begins with the clinical history and physical examination. The international scientific community has reached a consensus on how to measure, using various anthropometric parameters, the nutritional status of patients. These can be divided into objective and subjective (Yang, Xie et al. 2024).

Objective nutritional evaluation.

With this type of evaluation, objective data is obtained, based on measurements of different parameters, which reflect nutritional status. Within this type of evaluation are anthropometric measurements, estimation of body composition, and biochemical laboratory tests, the latter being frequently used due to their easy access, relatively low cost, and reproducibility (Teodoro, da Silva, et al. 2024).

Anthropometric measurements.

Unintentional weight loss is common in cancer patients and has been considered a variable of greater value than BMI alone for the detection of malnutrition. The decrease in body weight can be measured based on the weight loss over 6 months, expressed as a percentage of loss and classified as 5% (mild), 5-10% (moderate), and > 10% (severe), being the calculation equation the following (Chen, Huang, et al. 2024):

Percentage (%) weight loss = (usual weight-current weight/usual weight) x 100.

According to this estimate, both a rapid and significant decrease would be an indicator of nutritional deficit. The objectives of nutritional treatment are to prevent and treat malnutrition, reinforce the effects of antitumor treatment by reducing its adverse effects, and improve quality of life. The nutritional assessment of the cancer patient should begin at the time of diagnosis and be repeated at each visit to initiate nutritional intervention early before the general condition is severely compromised and the chances of recovering from a normal situation are slim (Chonmaitree, Sudcharoen, et al. 2024).

It can be said that nutritional intervention is essential to prevent and/or reverse malnutrition through an energy and protein balance, in addition to an adequate supply of vitamins, minerals, trace elements, and electrolytes. However, nutritional intervention is not usually considered fundamental within oncological treatment, but it is necessary in all stages of the disease and all therapeutic strategies. Offering patients individualized nutritional support and support makes them confident and expect positive results in the treatment of their disease, thus allowing them to improve their QoL (Yu, Lam et al. 2024).

The weight-height index (weight (kg)/height (cm), which is the ratio of current weight to the ideal value for sex and height, is considered significant in terms of malnutrition when it decreases by 75%. However, this method can lead to errors such as establishing standard ideal weight values. The other limitation of this method is imposed by the reference tables that are not adjusted for age, as well as weight changes based on parameters derived from the underlying pathology such as the change

in fluid balance, the latter situation being Applicable to the measurement of percentage change in body weight (Bozzetti 2024).

It has been observed that the BMI suffers less alteration about significant weight loss (> 10%) in cancer patients, that is, with significant weight losses, the value of this index may not alter significantly, which suggests that It is not a sensitive indicator of malnutrition. BMI also does not provide adequate information about the effects of nutrition on weight, which is an inappropriate measure of nutritional status in patients who are going to start chemotherapy. On the other hand, a decrease in BMI has been related to eating difficulties where there is a significant linear trend between the two, that is, the lower the BMI, the greater the difficulties (de Souza-Silva, Calixto-Lima, et al. 2024).

The measurement of subcutaneous folds and brachial muscle circumference has also been used as a method to evaluate nutritional status in cancer patients. Triceps skinfold measurement is an objective, inexpensive, and practical method that evaluates fat mass and the patient's caloric reserve. It is estimated that the deficiency of the fat reserve is mild, if the measurement is within the 30-40th percentile of the standard, moderate between 25-30, and severe less than the 25th percentile. The measurement of the brachial muscle circumference allows for estimating the body protein stores and evaluating muscle loss and protein-calorie malnutrition (Chang, Gao et al. 2024).

Despite the benefits of body composition methods in nutritional evaluation, the body mass index continues to be used in nutritional evaluation, and in our context, there are insufficient studies that demonstrate the role of these indicators in the accurate nutritional evaluation of patients with lung cancer. The present study was carried out to characterize clinical markers and nutritional status in patients with lung cancer at the Saturnino Lora Provincial Clinical Surgical Teaching Hospital of the province of Santiago de Cuba from December 2015 to March 2016 (Konishi, Urabe, et al. 2024).

2. MATERIAL AND METHOD.

Classification and context of the study.

An observational, descriptive, and cross-sectional study was carried out on patients with lung cancer who attended the Clinical Trial consultation of the Specialty Polyclinic belonging to the Saturnio Lora Provincial Clinical Surgical Teaching Hospital in the province of Santiago de Cuba, from December 2015 to March 2016 (Rosa, Wiegert et al. 2024).

Universe and sample.

The universe was made up of 169 patients with lung cancer treated in the Clinical Trial consultation of the Specialty Polyclinic belonging to the Saturnio Lora Provincial Clinical Surgical Teaching Hospital of the province of Santiago de Cuba, in the period from December 2015 to March 2016 with ages between 28 and 88 years, where both females and males were included without distinction. The sample consisted of 61 of them after a simple random sample (Luz, Pereira et al. 2024)

Variables.

Age, sex, stage, BMI, arm fat area, arm muscle area, triceps fold. Data collection procedures and instruments.

The data was obtained through an individual interview and information was collected from the Medical Records of these patients, then placed in a data collection form. Additionally, some anthropometric measurements were taken during the consultation, such as weight (Kg), height, and triceps fold (PT; in mm). Arm circumference (CB; in mm). All measurements were recorded by the same person to minimize errors in the methodology (Fastrès, Cécile et al. 2024).

Statistical processing.

The data were collected in a spreadsheet and tabulated in Excel. For the statistical analysis of the data, the statistical program SPSS 21.0 (Statistical Package for Social Sciences. Version 21.0) was used, which allowed the pertinent statistical calculations to be applied. Data is presented in tables and graphs through numbers and percentages. The results obtained were presented in tables. To write the final report and prepare the diagrams, tables, and graphs, the Microsoft Office 2007 package was used (Vigna, Gori, et al.).

Ethical aspects.

The research was carried out by the four basic ethical principles: respect for people, beneficence, non-maleficence, and justice. The patients treated gave their consent after a detailed explanation of the research in question, its characteristics, its objectives, and its benefits (Fastrès, Vangrinsven, et al. 2024).

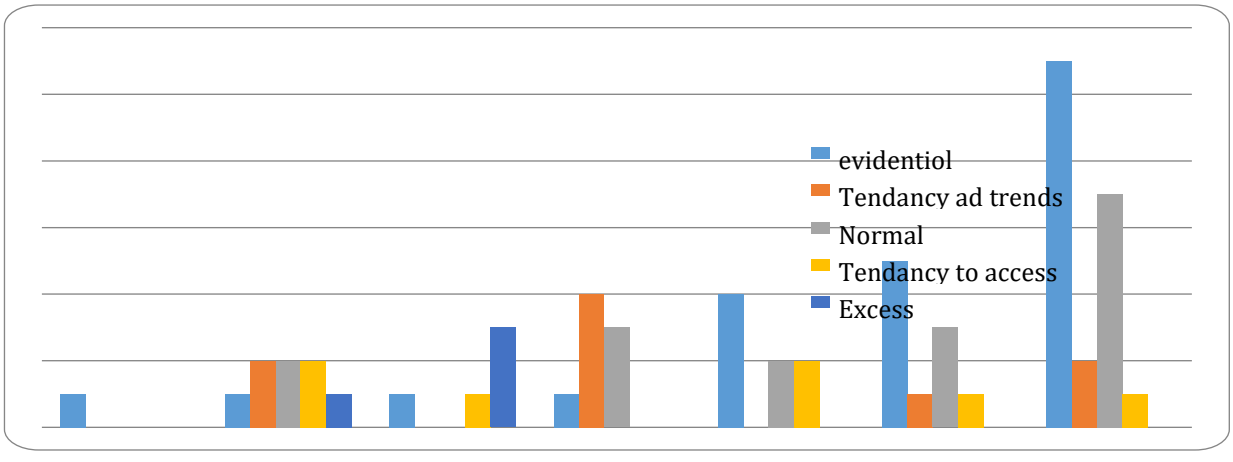
3. RESULTS.

Table 1:Patients with lung cancer according to age and sex. Provincial Clinical Trial Consultation. Saturnino Lora Provincial Hospital. December 2015-March 2016.

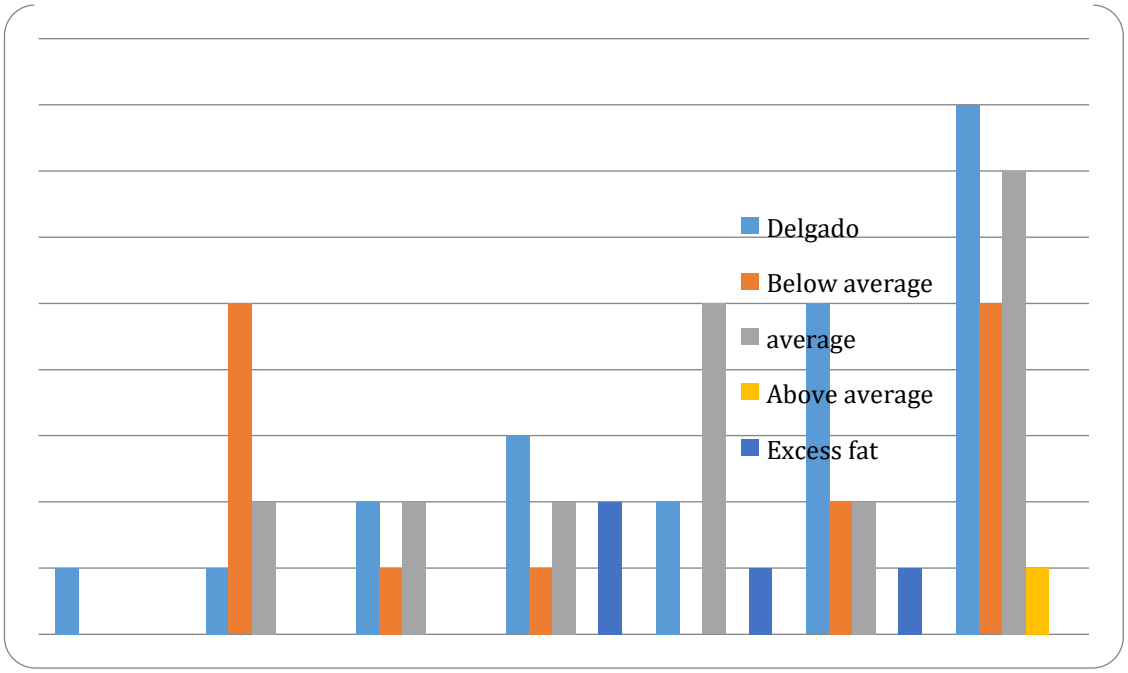
Age (years)	Sex				Total	
	Female		Masculine			
	No.	%	No.	%	No.	%
20-30	1	3.4	1	3.1	2	3.3
31-40	1	3.4	0	0	1	1.6
41-50	1	3.4	3	9.4	4	6.6
51-60	4	13.8	10	**31.2**	14	22.9
61-70	13	**44.8**	6	18.8	19	31.1
71-80	8	27.6	10	**31.2**	18	29.5
81-90	1	3.4	2	6.2	3	4.9
Total	29	45.9	32	52.4	**61**	100

4. FOUNTAIN:

Collection form Of the total of 61 patients, 29 are women, which represents 47.5% of the total, and 32 are men, representing 52.5% of the total. The ages at which there is the highest incidence are, in the case of women, those between 61 and 70 years; in the case of men with two peaks, the first between 51 and 60 years and the second between 71 and 80 years (Janlio 2024).

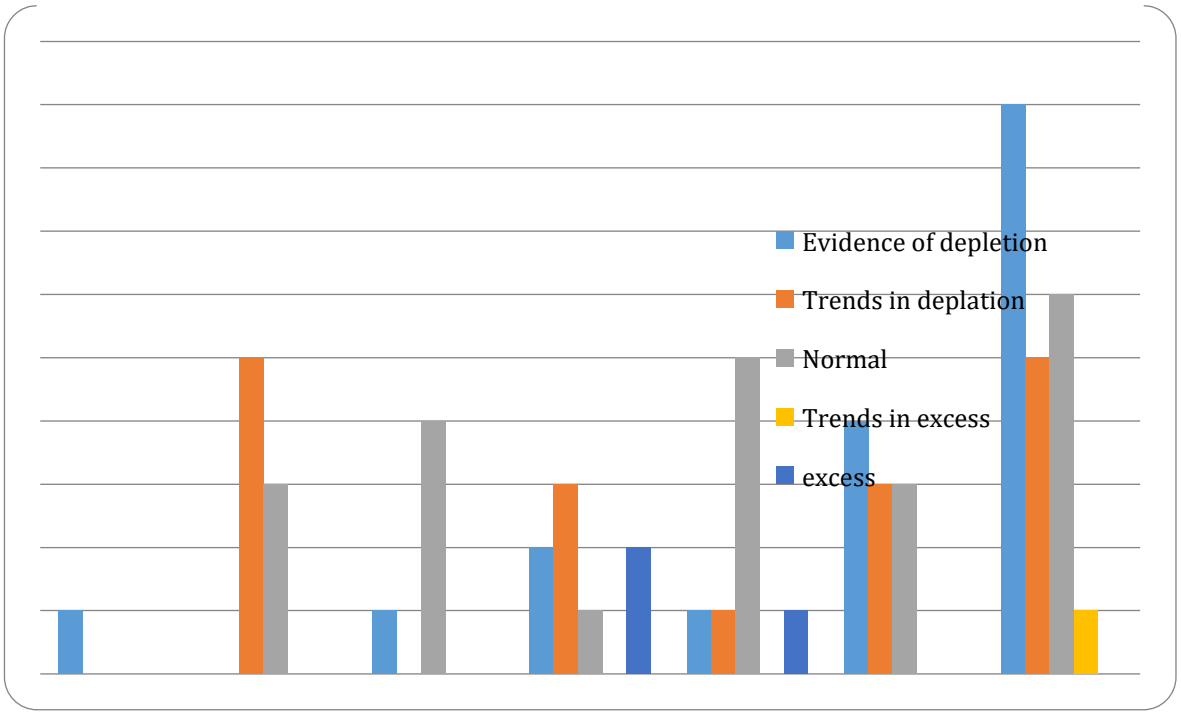


Graphic 1:Distribution between cancer stage and muscle area in patients with lung cancer. Provincial Clinical Trial Consultation. Saturnino Lora Provincial Hospital. December 2015-March 2016. There were 21 patients in stage IV and 10 in stage III, for a total of 31 cases in terminal stages. The relationship between the stage of the disease and the muscle area is evident since, of the total number of patients, 24 have evidence of depletion and of those, 16 are in the terminal stages (I and IV). (Figure 1) (Simões, Donadio et al. 2024).



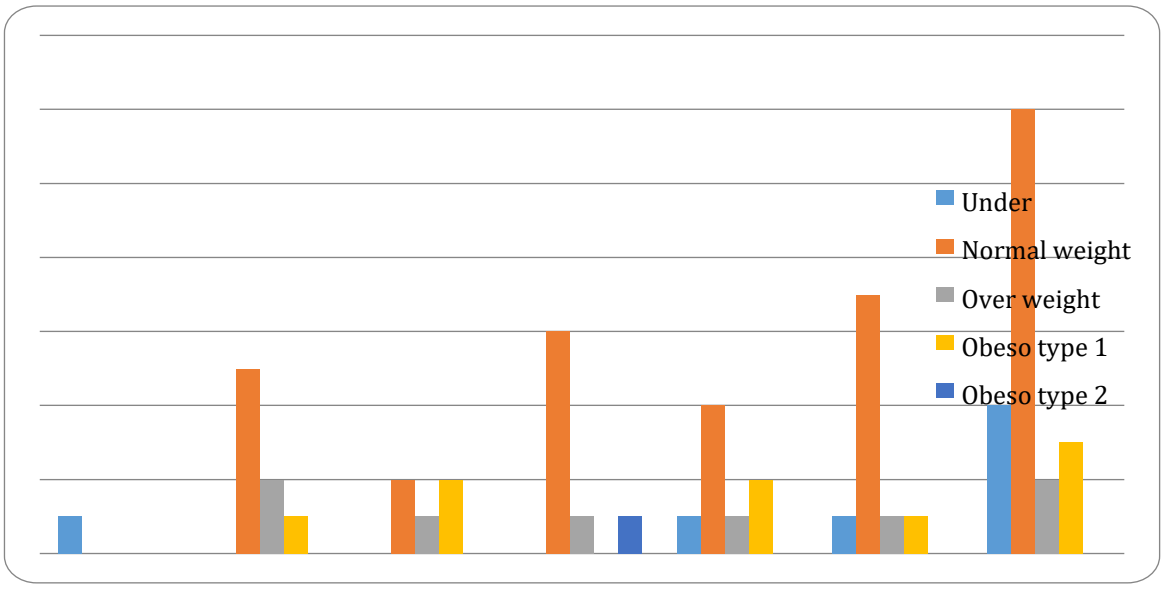
Fountain: Collection form

Graph 2: Distribution between cancer stage and triceps fold in patients with lung cancer. Provincial Clinical Trial Consultation. Saturnino Lora Provincial Hospital. December 2015-March 2016. Of the sample studied, 22 patients were thin concerning the triceps fold, of which the majority were in the final stages of the pathology. However, this figure was followed by the average individuals with a total of 20 subjects. (Graph 2) (Dutta and Chatterjee 2024).



Graph 3:Distribution between cancer stage and arm fat area in patients with lung cancer. Provincial Clinical Trial Consultation. Saturnino Lora Provincial Hospital. December 2015-March 2016 (Butnariu).

About the fatty area of the arm, it was found that the largest number of patients were included within the normal ranges with a total of 22 individuals. However, in stages IIIb and IV of the disease the predominance was evidence of depletion. (Figure 3) (Wang, Jin et al. 2024).



Graph 4:Distribution between cancer stage and BMI in patients with lung cancer. Provincial Clinical Trial Consultation. Saturnino Lora Provincial Hospital. December 2015-March 2016. There was a significant predominance of normal weight patients in the classic evaluation of nutritional status through BMI, these being represented by a total of 36 individuals with similar distribution in different stages, although it was greater in stage IV with 12 subjects. (Figure 4) (Zuckerman, Wang et al. 2024).

5. DISCUSSION.

Years ago, several epidemiological studies on lung cancer were published, in which it was suggested that the percentage of men affected is notably higher than that of women, with a male/female ratio of 2:1. The trend was that lung cancer mainly affected the male sex, since among the predisposing factors is the habit of smoking, which was more prevalent in men than in women. Currently, with the incorporation of women into society as equals, the incidence of this entity in both sexes has been equalized, which is demonstrated in the first table (Mazorra-Manzano and Ramírez-Suárez 2024).

The present study shows the epidemiological characterization of the patients evaluated in the provincial Clinical Trial consultation of the Saturnino Lora Provincial Hospital, in the period between December 2015 and March 2016. Of the total of 61 patients, 29 are women, which represents 47.5% of the total, and 32 men for 52.5% of the total. The ages at which there is the highest incidence are, in the case of women, those between 61 and 70 years; in the case of men with two peaks, the first between 51 and 60 years old and the second between 71 and 80. This coincides with the bibliography which suggests that old age is a predisposing factor for the appearance of neoplastic processes, in addition to increasing their survival (Virk, Virk, et al. 2024).

There are works in the literature that analyze the relationship between the nutritional status of patients with lung cancer and long-term survival, regardless of the extent of the tumor and the histological type. The evaluation of nutritional status is acquiring increasing importance in the management of these patients.[18] However, more studies are needed to better understand the impact of this assessment on the treatment and outcome of individuals with this type of neoplasia. Measuring the brachial muscle circumference allows for estimating body protein deposits and evaluating loss of muscle mass and protein-calorie malnutrition (Oladiji, Oladele, et al.).

In this research, the relationship between cancer stage and muscle area is evident, observing how as this pathology evolves there is an increase in the tendency towards depletion, and that in the last stages of the same, there is no longer a trend but a marked one. evidence of depletion. This coincides with the study carried out by Piskorz, Poland 2011, where it is proposed that during this pathology, malnutrition causes a decrease in muscle strength, and therefore its muscle area (POPESCU, UZUN et al.).

However, the second most significant trend is towards normality, which, although it continues to be much lower than the first, does report data of interest, from which it could be assessed whether it is related to the treatment, age, sex, or other variable of interest; which could constitute a starting point for future research. The measurement of the triceps fold is an objective, inexpensive, and practical method that evaluates fat mass and the patient's caloric reserve. In the present work, the relationship between cancer stage and tricipital fold is shown, with the thin status being the most represented with 22 of the 61 patients in the study, this being more evident in stages IIIb and IV of the disease (Delorme 2024).

coincides with the researcher María Teresa Fernández López in a study carried out at the University Hospital Complex of

Ourense, Spain, in which she stated that the prevalence of malnutrition in cancer patients evaluated in her consultation was high; Therefore, it emphasizes the need for an adequate nutritional assessment as a basis to identify those patients with malnutrition or risk of malnutrition. This also corresponds to what was found in the literature. where the usefulness of this assessment to guide the need for nutritional treatment is expressed. The fat area is a good indicator of malnutrition by default according to various authors (Chonmaitree, Sudcharoen, et al. 2024).

The relationship between the cancer stage and the fat area of the patients analyzed is justified in this research work, observing a predominance of the normal fat area in 20 subjects. However, this data is followed by evidence of depletion in 18 of those examined, who are mainly in the final stages of the disease, represented by a figure of 13 inspected. This does not coincide with the Chilean scientist Teresa Massip, in an investigation carried out in Santiago de Chile, in which he states that the predominance of evidence of depletion is absolute in the patients examined by his work team (Yu, Lam et al. 2024).

The existing relationship between BMI and the stage of the disease shown in this study confirms the contradiction between the results of the aforementioned indices and BMI, since according to this last indicator the majority of patients are of normal weight, with a variation minimal at different stages of the disease, which differs from the other indicators. This finding coincides with other articles in which the use of other equations is recommended to have a more adequate nutritional evaluation of patients with this entity (Bozzetti 2024).

This result is of great importance because it demonstrates the discordance between the index traditionally most used in medical practice to measure nutritional status and the others. The use of BMI as the only criterion generates a large number of biases since in the previous data it can be observed that the deterioration of the nutritional status of patients with lung cancer is real, contradicting the previously mentioned variable (de Souza-Silva, Calixto-Lima, et al. 2024).

Although BMI is indeed a quick, easy-to-perform, and low-cost indicator, it should not be used in isolation as a method for diagnosing nutritional deficiency. The measurement of subcutaneous folds and brachial muscle circumference have also been used as methods to evaluate nutritional status in cancer patients; Hence, the use of other more specific anthropometric variables can be understood, which together provide a more accurate assessment of the patient with this entity (Rosa, Wiegert et al. 2024).

6. CONCLUSIONS.

There was a slight predominance of men over women. Stage IV of the disease presented a marked superiority in the number of patients. The triceps fold, muscle area and fat area showed more correspondence in the nutritional evaluation of the most advanced stages of lung neoplasia concerning the body mass index (BMI), thus constituting the indicators of the arm body composition the most appropriate and objective markers in the nutritional evaluation of patients with this pathology

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