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Appetite disorders in cancer patients: Impact on nutritional status and quality of life

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ABSTRACT

Cancer patients are at high risk of malnutrition due to several symptoms such as lack of appetite. The aim of this study was to determine the prevalence of different appetite disorders in cancer patients and their influence on dietary intake, nutritional status, and quality of life. We conducted a cross-sectional study of cancer patients at risk of malnutrition. Nutritional status was studied using Subjective Global Assessment, anthropometry, and grip strength. Dietary intake was evaluated with a 24-h recall, and patients were questioned about the presence of changes in appetite (none, anorexia, early satiety, or both). Quality of life was measured using EORTC-QLQ-C30. Multivariate analysis was performed using linear regression. 128 patients were evaluated. 61.7% experienced changes in appetite: 31% anorexia, 13.3% early satiety, and 17.2% both. Appetite disorders were more common in women and with the presence of cachexia. The combination of anorexia and satiety resulted in a lower weight and BMI. However, there were no significant effects on energy or macronutrient intake among different appetite alterations. Patients with a combination of anorexia and early satiety had worse overall health perception, role function, and fatigue. Appetite disorders are highly prevalent among cancer patients at risk of malnutrition. They have a significant impact on nutritional status and quality of life, especially when anorexia and early satiety are combined.

1. Introduction

Cancer represents a considerable burden of disease on the general population due to its high prevalence and consequences for morbidity, mortality and quality of life. Cancer causes nearly 30% of all deaths in Spain and is the second most common cause of mortality (Calleja Fernández et al., 2015; Instituto Nacional de Estadística Nota de Prensa Año, 2011). Malnutrition is present at the moment of cancer diagnosis in up to 40% of patients, and this rate rises to 80% in patients with advanced malignancies (Nelson & Walsh, 2002). Malnutrition is also an important cause of morbidity and responsible for 20% of deaths in cancer patients (Capra, Ferguson, & Ried, 2001). Cachexia can be defined as a complex syndrome in which inflammation leads to early satiety and anorexia, decreased body-fat, and fat-free body mass, and

Abbreviations: BMI, Body Mass Index; CCSG, Cachexia Cancer Study Group; CHO, Carbohydrates; EORTC-QLQ-C30, European Organization for Research and Treatment of Cancer Quality of Life Core Questionnaire; FFM, Fat free mass; FFMI, Fat free mass index; GI, Gastrointestinal; HN, Head and Neck; QoL, Quality of life; SGA, Subjective Global Assessment.

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weakness (Muscaritoli et al., 2010). With a prevalence ranging 70–80% in advanced phases of the disease, cancer cachexia is also associated with poor response to chemotherapy, increased susceptibility to treatment-related adverse events, shorter survival, and is also a cause of morbidity and deterioration of quality of life (QoL) (Ross et al., 2004; Wigmore, Plester, Richardson, & Fearon, 1997).

Reduced food intake is a commonly found problem in patients with cancer. It is related to several factors such as gastrointestinal symptoms (e.g., vomiting, diarrhea), tumor location (e.g., esophagus or oral cavity, causing dysphagia), toxicities related to treatments (e.g., radiation-associated mucositis), altered perception of tastes and odors, and reduction of appetite (Gómez-Candela et al., 2003). The foods most commonly affected by these changes are high-protein foods (including meat) and high-fat foods (Mattes, Arnold, & Boraas, 1987). Appetite disorders may be a common problem among oncologic patients; some studies described a prevalence of around 80% in patients with advanced tumors. The causes of lack of appetite are diverse: the systemic inflammatory response generated by the tumor can suppress appetite in the central nervous system; both chemotherapy and radiotherapy (RT) can reduce hunger as an adverse event; anatomic changes after surgery can limit the intake of food (e.g., total gastrectomy); nutrient deficiency (e.g., zinc) can be related to anorexia. Finally, psychological symptoms like anxiety and depression, can be associated with appetite suppression (O'Gorman, McMillan, & McArdle, 1998; Chiu, Hu, & Chen, 2000; Ogama et al., 2010; Kamiji, Troncon, Suen, & de Oliveira, 2008; Ezeoke & Morley, 2015). Disturbances of appetite can be manifested in different ways: a reduction in the desire to consume food (anorexia), the early apparition of satiety, or even a combination of both. The differentiation among the different appetite alteration may be relevant due their potential effects on nutritional intake and status, and the different treatments that can be offered to patients (prokinetics for satiety, appetite stimulants for anorexia).

The aim of this study is to determine the prevalence of each type of appetite disorder in cancer patients, and to associate each one of them with oral intake, and quality of life. We hypothesized that the coexistence of both anorexia and early satiety may be associated with a greater impact on intake, nutritional status, and quality of life than each one of these symptoms independently.

1.1. Patients and methods

This cross-sectional study took place at the Complejo Asistencial Universitario de León (Spain) between February 2013 and June 2014. Patients attending the outpatient clinic of the Clinical Nutrition and Dietetics Unit were consecutively recruited if they fulfilled the inclusion criteria: a diagnosis of solid or hematological malignancy, age $\geq$18 yr, and at current risk of malnutrition (Malnutrition Screening Tool score $\geq$ 2 points). Exclusion criteria included previous dietary counseling, patients receiving any type of artificial nutrition support (oral nutritional supplements, enteral nutrition, parenteral nutrition), treatment with appetite stimulant drugs (e.g., megestrol), or inability to perform either body composition or dietary assessment.

Patients were asked about recent (1 month) changes in their appetite: a reduction or lack of the sensation of hunger or in the desire to consume food was classified as anorexia; a precocious sensation of fullness when eating that impeded a complete intake of a meal was classified as early satiety; the combination and the absence of both symptoms was considered as well. Nutritional status was evaluated using Subjective Global Assessment (SGA) (Kondrup, 2003). Anthropometry included the measurement of height and body weight, body mass index (BMI), grip strength (Smedlay's Dynamo Meter™) and determination of fat-free mass (FFM) and fat mass (FM) by a bioelectrical impedance (Tanita Body Composition Analyzer TBF-300™). The Fat-Free Mass Index (FFMI) was calculated by dividing the individual's FFM in kilograms by the square of their height in meters. Usual weight was reported by the patient. Body composition and grip strength evaluation were performed by physicians specialized in Clinical Nutrition, with a wide experience un nutritional assessment, Cachexia was defined by CCSG (Cachexia Cancer Study Group) definition (Fearon, Voss, & Hustead, 2006). Dietary assessment included a 24-h recall, which was guided and subsequently analyzed by an expert dietician using Dietsource 3.0™ (Novartis Medical Nutrition SA, 1997–2003). These data were obtained and collected in a structured questionnaire in a single session, during their first attendance to the nutrition clinic.

Quality of life was evaluated by the European Organization for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C30) (Bottomley et al., 2005). It was developed for cancer patients enrolled in clinical trials and it is reliable in multicultural contexts. It assesses several factors that contribute to QoL, including physical ability, role, cognitive status, emotional and social factors, as well as symptoms (e.g. fatigue, pain, dyspnoea and insomnia).

1.2. Statistical analysis

Normally distributed quantitative variables were summarized as means and standard deviations (SDs) and compared using Student's t-test or ANOVA. Variables not matching a normal distribution were summarized as medians and interquartile ranges (IQRs), and compared using the Mann-Whitney *U* test or Kruskal-Wallis test. Categorical variables were summarized as percentages and compared using the χ^2 test. Liner regression was used for multivariate analysis. For all tests $p < 0.05$ was considered significant.

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving human patients were approved by the Ethics and Clinical Investigation Committee of the hospital. Verbal informed consent was obtained from all patients, in the presence of witnesses, according the Spanish legislation and following the recommendations of the Ethics Committee.

2. Results

The study included 128 consecutive patients, as any of them presented any exclusion criteria; the characteristics of the sample are given in Table 1. According to SGA, 24.8% of patients were well-nourished (SGA-A), 28.0% were at risk of malnutrition or moderately malnourished (SGA-B), and 47.2% were severely malnourished (SGA-C). Patients ate 1856.1 (731.9) kcal and 73.8 (33.8) g of protein, which represented 29.8 kcal/kg and 1.25 g/kg respectively. Protein accounted for 17.0 (4.3) % of dietary energy. Carbohydrates accounted for 46.6 (10.0) % of dietary energy and fat 35.5 (9.0) %, with a daily intake of fiber of 16.2 (10.3) g. There were no significant differences in energy [SGA-A 32.7 (12.6) kcal/kg, SGA-B 26.6 (11.1) kcal/kg, SGA-C 29.6 (11.8) kcal/kg, $p = 0.097$] or protein intake [SGA-A 1.38 (0.51) g/kg, SGA-B 1.42 (2.66) g/kg, SGA-C 1.23 (0.54) kcal/kg, $p = 0.097$] according to nutritional status.

More than a half (61.8%) described changes in their appetite: 31.3% anorexia, 13.3% early satiety, 17.2% both. Appetite disorders were significantly more common in women (anorexia 29.5%, early satiety 22.7%, both 25.0%) than in men (anorexia 32.1%, early satiety 8.3%, both 13.1%; $p = 0.011$), with the presence of cachexia (cachexia vs no cachexia: anorexia 42.5% vs 24.4%, early satiety 15.0% vs 7.3%, both 22.5% vs 19.5%; $p = 0.046$), and in patients who