

Nutritional Counseling in Patients with Head, Neck and Esophagus Cancer in (Chemo)Radiotherapy

doi: <https://doi.org/10.32635/2176-9745.RBC.2020v66n1.531>

Aconselhamento Nutricional em Pacientes com Câncer de Cabeça, Pescoço e Esôfago em Tratamento (Químio)Radioterápico
Asesoramiento Nutricional en Pacientes con Cáncer de Cabeza, Cuello y Esófago em Tratamiento (Químio)Radioterápico

Sheila Cristina Pootz¹; Dóris Gonçalves Boff²; Raquel Canuto³; Janaína Brollo⁴; Ana Carolina Pio da Silva⁵

Abstract

Introduction: The presence of a nutritionist in the radiotherapy sector intends to recover and maintain the nutritional status of the patients. **Objective:** To compare the results of daily nutritional counseling with weekly nutritional advising for patients with head, neck and esophagus cancer in radiotherapy treatment. **Method:** 29 patients were assigned to the study and randomly divided into two groups. The intervention group received nutritional advice daily. The standard group received weekly nutritional counseling. For both groups, body weight, brachial or calf circumference, global subjective evaluation produced by the patient (PG-SGA) and calculation of the daily dietary recall were measured. **Results:** The majority of the participants were male (80%), mean age 62.7 ± 26 years. Oral nutrition therapy was required for 48% of the individuals and at the end of the treatment 60% were in use of enteral nutrition. The mean weight loss in the intervention group was 1.89 ± 2.58 kg compared to the mean weight loss in the standard group of 9.92 ± 6.68 kg (p < 0.001). Half of the patients in the intervention group who began treatment categorized by PG-SGA in A, finished treatment in the same category (41.7%). More than 40% of patients in the intervention group achieved caloric needs during five weeks of treatment. **Conclusion:** This study found significant results for lower weight loss in patients with daily nutritional counseling. These results may in the future be precursors of guidelines that steer and direct professionals to specific conducts to patients with this profile.

Key words: Head and Neck Neoplasms/radiotherapy; Esophageal Neoplasms/radiotherapy; Nutritional Status.

Resumo

Introdução: A presença de um nutricionista no setor de radioterapia objetiva a recuperação e a manutenção do estado nutricional dos pacientes. **Objetivo:** Comparar os resultados do aconselhamento nutricional diário com o aconselhamento nutricional semanal em pacientes com câncer de cabeça, pescoço e esôfago em tratamento radioterápico. **Método:** Foram selecionados 29 pacientes para o estudo e separados aleatoriamente em dois grupos. O grupo intervenção recebeu aconselhamento nutricional diariamente. O grupo padrão recebeu aconselhamento nutricional semanalmente. De ambos os grupos, foram aferidos peso corporal, circunferência braquial ou de panturrilha, avaliação subjetiva global produzida pelo próprio paciente (ASG-PPP) e cálculo do recordatório alimentar diário. **Resultados:** A maioria dos participantes era do sexo masculino (80%), com média de idade de 62,7 ± 26 anos. A terapia nutricional oral foi necessária para 48% dos indivíduos e, ao final do tratamento, 60% estavam em uso de nutrição enteral. A perda de peso média no grupo intervenção foi de 1,89 ± 2,58 Kg comparada à perda média de peso no grupo padrão de 9,92 ± 6,68 Kg (p=0,017). Metade dos pacientes do grupo intervenção, que iniciaram o tratamento categorizados pela ASG-PPP em A, finalizou o tratamento nessa mesma categoria (41,7%). Mais de 40% dos pacientes do grupo intervenção alcançaram as necessidades calóricas durante cinco semanas do tratamento. **Conclusão:** Encontraram-se resultados significativos para menor perda de peso em pacientes com aconselhamento nutricional diário que podem futuramente ser precursores de diretrizes que orientem e direcionem profissionais a condutas específicas aos pacientes com esse perfil.

Palavras-chave: Neoplasias de Cabeça e Pescoço/radioterapia; Neoplasias Esofágicas/radioterapia; Estado Nutricional.

Resumen

Introducción: La presencia de un nutricionista en el sector de radioterapia intenciona la recuperación y mantenimiento del estado nutricional de los pacientes. **Objetivo:** Comparar los resultados del asesoramiento nutricional diario con el asesoramiento nutricional semanal en pacientes con cáncer de cabeza, cuello y esófago en tratamiento radioterápico. **Método:** Fueron seleccionados 29 pacientes para el estudio y separados aleatoriamente en dos grupos. El grupo de intervención recibió asesoramiento nutricional diariamente. El grupo estándar recibió asesoramiento nutricional semanalmente. De ambos grupos se evaluaron peso corporal, circunferencia braquial o de pantorrilla, evaluación subjetiva global producida por el propio paciente (ASG-PPP) y cálculo del recordatorio alimentario diario. **Resultados:** La mayoría de los participantes eran del sexo masculino (80%), con una media de edad de 62,7 ± 26 años. La terapia nutricional oral fue necesaria para el 48% de los individuos y al final del tratamiento el 60% estaban en uso de nutrición enteral. La pérdida de peso media en el grupo de intervención fue de 1,89 ± 2,58 Kg comparada con la pérdida media de peso en el grupo estándar de 9,92 ± 6,68 Kg (p<0,001). La mitad de los pacientes del grupo intervención que iniciaron el tratamiento categorizados por la ASG-PPP en A, finalizaron el tratamiento en esa misma categoría (41,7%). Más del 60% de los pacientes del grupo de intervención alcanzaron las necesidades calóricas durante cinco semanas del tratamiento. **Conclusión:** Este estudio encontró resultados significativos para una menor pérdida de peso en pacientes con asesoramiento nutricional diario. Estos resultados pueden en el futuro ser precursores de pautas que orientan y dirigen profesionales a conductas específicas a los pacientes con este perfil. **Palabras clave:** Neoplasias de Cabeza y Cuello/radioterapia; Neoplasias Esofágicas/radioterapia; Estado Nutricional.

¹ University of Caxias do Sul. Hospital Geral de Caixas do Sul. Caxias do Sul (RS), Brazil. Orcid id: <https://orcid.org/0000-0001-9123-0159>

² Unit of High Complexity in Oncology. Sector of Radiotherapy of the General Hospital. Caxias do Sul (RS), Brazil. Orcid id: <https://orcid.org/0000-0001-7974-4202>

³ Department of Nutrition. Federal University of Rio Grande do Sul. Porto Alegre (RS), Brazil. Orcid id: <https://orcid.org/0000-0002-4042-1913>

⁴ General Hospital of Caxias do Sul. Caxias do Sul (RS), Brazil. Orcid id: <https://orcid.org/0000-0001-8201-6003>

⁵ University of Caxias do Sul. Caxias do Sul (RS), Brazil. Orcid id: <https://orcid.org/0000-0001-8898-3352>

Address for Correspondence: Sheila Cristina Pootz. Rua Prefeito Wenceslau Borini, 1935, apto. 103 – Canta Galo. Rio do Sul (SC), Brazil. CEP 89163-062. E-mail: sheilacrispz@gmail.com



INTRODUCTION

Head and neck cancer cause 350 thousand annual deaths and occurs in nearly 650 thousand individuals in the world per year¹. One of the characteristics of malnutrition is involuntary weight loss. The prevalence of this clinical condition is of nearly 35% to 60% already at the diagnosis where the intense catabolism and the presence of inflammatory cytokines induce the proteolysis, lipolysis and gluconeogenesis. Difficulties for oral nourishment – result of the orofacial location of the tumor – also contribute to reduce the habitual food intake and consequent reduction of body weight^{2,3}.

Radiotherapy is one of the antineoplastic treatment modalities for this type of tumor. During this period, the susceptibility to malnutrition intensifies since the exposure to radiation, the patient presents adverse symptoms as anorexia, dysphagia, odynophagia, mucositis, nausea and vomits that interfere in the oral intake, making it difficult or preventing it. The presence of a nutritionist in the sector of radiotherapy has the objective of optimizing the caloric-protein intake through adjustments of diet consistency, selection of the nutrition pathway, management of adverse symptoms, control of body composition and nutritional therapy. In addition, the nutritional orientations since the beginning of the treatment can prevent the aggravation of the adverse symptoms⁴.

The nutritional intervention before and during radiotherapy must be an integral part of the treatment to alleviate the patient, determine its nutritional risk and plan an individualized care, in order to achieve the caloric-protein input and the proper intake of nutrients and fluids. In addition, to bring awareness to the individual about the importance of the good nutritional status so the success of the treatment contributes for the adherence and the patient and its caretakers efforts in meeting the prescribed guidelines⁵.

This clinical trial had as objective the comparison of the results of the daily versus weekly nutritional counseling in order to verify whether the nutritional support performed more frequently to the patients with head, neck and esophagus cancer contributes for a better nutritional status in the radiotherapy treatment.

METHOD

Randomized, double unblind trial conducted at the radiotherapy ward of the High Complexity Oncology Unit (Unacon) of the General Hospital of Caxias do Sul. The randomization occurred from April to October 2018, upon previous approval by the Editorial Scientific Committee of the Hospital (COEDI) of the University of Caxias do Sul, report number 2,520,133.

All the patients accepted to participate of the study and signed the Informed Consent Form. The inclusion criteria comprehended the diagnosis of cancer localized in the head and neck or esophagus from the first day of the adjuvant or neoadjuvant radiotherapy treatment, could be in concomitant chemotherapy treatment, older than 18 years and without any other catabolic disease as the human immunodeficient virus (HIV) or cirrhosis. These data were obtained from each patient's chart.

In total, 29 patients were enrolled for the study, separated in two groups, one called intervention (GI) and the other, group standard (GS). The sample was separated randomly as follows: the first patient was assigned to GI, the second to GS, the third to GI and successively onward. The radiotherapy treatment varied from 28 to 35 days for each patient, which meant a treatment of four to seven weeks. GI received nutritional counseling in every day of the radiotherapy. GS received nutritional advice once a week during the radiotherapy treatment.

The nutritional counseling of GI was performed every day of the radiotherapy treatment and, first, it consisted in making the patient, its relatives and/or caretakers aware about the importance of the nutritional status for the good progress of the treatment, strategies of oral nutrition with adjustment of food consistency and use of oral nutritional therapy (ONT), schedule for administration of enteral diet – for the patients that needed enteral nutritional therapy (ENT) – and orientation of dripping, reminders of vial, infusion set and probe hygiene, management of adverse symptoms and reaffirmation of nutritional care during the period of radiation like avoiding acid food, source of caffeine, harsh food, to adjust hydric intake and stop smoking and alcohol use.

The GS followed the local consultation protocol with nutritional advice once a week. The patients of this group received the same advices of the GI, modifying only the frequency of consultations.

In order to compare the results of the nutritional status between the groups, the weight of the body mass, calf or brachial circumference were measured and applied the Patient-Generated Subjective Global Assessment (PG-SGA). These parameters were evaluated twice a week in the GI and once a week in the GS. The mean of calories intake per week of treatment in the two groups was calculated with the objective of analyzing the appropriateness of the caloric value ingested.

The weight of the body mass was checked in mechanic scale. Through the formula and classification of the Body Mass Index (BMI) proposed by the World Health Organization the nutritional status of the patient was classified. For patients under 60 years, the brachial circumference was verified and, in the individuals aged

or above 60 years, it was measured the calf circumference. These measures were compared weekly among the groups in order to observe changes in the body mass.

The PG-SGA was applied to evaluate the symptoms, classifying the patients in categories A, B or C, which are the instrument's classification that define, respectively, the patient in good nutritional status, moderately malnourished and severely malnourished. The instrument evaluates the history of the body weight, the presence of gastrointestinal symptoms, food intake, capacity of performing daily activities and composition of the body mass⁶.

For the evaluation of the appropriateness of the caloric food intake, it was collected daily, during all the days of the treatment, the Daily Dietary Recall (R24h). Of the individuals of the GI, collection occurred in the moment of the nutritional counseling and of the individuals of GS, they were approached before the radiotherapy treatment, resulting, therefore, in similar frequency of collecting the R24h. The registers were calculated with the program Dietwin® and the adequacy of the caloric intake was calculated by the parameters established by the National Consensus of Oncologic Nutrition⁷. To obtain the caloric value consumed by each individual, the calculations were performed daily and in the end of each week of treatment, it was found the mean of the calories ingested. After obtaining the individual weekly mean, it was reached the mean caloric intake of each group.

The descriptive data were presented through absolute and relative frequencies. To compare the anthropometric parameters between the two groups in the beginning and in the end of the treatment, it was calculated the mean difference and applied the Mann Whitney test because of the asymmetry of the data. It were adopted the Pearson chi-square test and the exact test of Fisher to analyze the comparison of the modification of PG-SGA categories in the two groups, in the beginning and in the end of the treatment and of the percentage of caloric food intake adequacy in each week of treatment, according to the groups. All the analyzes were performed by the software Statistical Package for the Social Sciences (SPSS) 18, being considered level of significance of 5%.

RESULTS

Of the total of the population investigated, 80% of the participants were males, 88% smokers and 56%, alcohol users (Table 1). The mean age of the patients was 62.7 ± 26 years. The local of great incidence of tumor were esophagus (28%), larynx (20%) and oropharynx (16%). In relation to the pauses of the treatment, 33.3% occurred in GI and in GS, 69.2% and the motives for

these interruptions are described in Table 1. Of the total of the participants, 72% also submitted to concomitant chemotherapy treatment. ONT was necessary for 48% of the individuals and, in the end of the treatment, 60% were in use of enteral nutrition – 14 through nasoenteral probe (56%) and one through gastrostomy (4%).

In relation to losses, two patients were excluded from the sample soon after enrollment. One of them quit the treatment and for the other, the treatment was postponed due to clinical motives. In GS, there was no patient losses. In GI, two patients died because of causality. Therefore, with 25 patients in total, the final sample consisted of 12 patients in the group intervention and 13 in the group standard.

The mean weight loss in GI during the treatment was 1.89 ± 2.58 Kg. GS presented mean weight loss during the treatment of 9.92 ± 6.68 Kg (Table 2). Regarding the measures of the circumference, no significant differences were observed ($p=0.371$), but it was noticed slower or faster reduction of the patients muscle mass (Table 2).

As for PG-SGA, there was no statistic difference, however, 41.7% of the patients of GI finalized the treatment in category A, a result that indicates good nutritional status and half of the patients (5) that initiated the treatment classified in this category, remained in it (Table 3).

Regardless of not presenting statistical difference, more than 40% of the patients in GI reached the total caloric value from the second to the sixth week of radiotherapy treatment, being the fourth and the fifth week, the weeks with better adequacy, since in these weeks there was great occurrence of probe placement. The last week demonstrates increase of the caloric intake in GS, a consequence of the probe placement, that occurred later in this group (Figure 1).

DISCUSSION

A clinical finding, common in patients with head, neck and esophagus cancer is the presence of inflammatory markers in high levels in the blood as pro-inflammatory cytokines interleukins 1 (IL-1), interleukin 6 (IL-6) and tumor necrosis factor alpha (TNF- α), that accelerate the pathways of catabolism and difficult the healing. This promotes important loss of muscle mass and adipose tissue, generating insulin resistance status, systemic inflammation and adrenergic activation, which can lead the patient to cachexia, creating a condition of inflammation, which results in lower response to the treatment, lower quality of life and survival and more time of hospitalization⁸⁻¹⁰. In addition, the exacerbated or prolonged inflammatory sign can result in neuroinflammation with consequent

Table 1. Characteristics of the population investigated

Variable	Total n = 25 (%)	Group Intervention N = 12 (%)	Group Standard N = 13 (%)
Gender			
Female	5 (20)	3 (25)	2 (15.4)
Male	20 (80)	9 (75)	11 (84.6)
Age			
31 to 50	2 (8)	0 (0)	2 (15.4)
51 to 70	18 (72)	8 (66.7)	10 (76.9)
71 to 99	5 (20)	4 (33.3)	1 (7.7)
Former tobacco-addiction			
Yes	22 (88)	10 (83.3)	12 (92.3)
No	3 (12)	2 (16.7)	1 (7.7)
Former Alcohol Use			
Yes	14 (56)	5 (41.7)	9 (69.2)
No	11 (44)	7 (58.3)	4 (30.8)
Location of the tumor			
Parotid region	1 (4)	1 (8.3)	0 (0)
Larynx	5 (20)	2 (16.7)	3 (23.1)
Hypopharynx	3 (12)	0 (0)	3 (23.1)
Submandibular Gland	1 (4)	1 (8.3)	0 (0)
Oropharynx	4 (16)	1 (8.3)	3 (23.1)
Esophagus	7 (28)	6 (50)	1 (7.7)
Lower lip	1 (4)	0 (0)	1 (7.7)
Palate	1 (4)	0 (0)	1 (7.7)
Mouth	1 (4)	1 (8.3)	0 (0)
Base of the tongue	1 (4)	0 (0)	1 (7.7)
Number of sessions of radiotherapy			
<= 28	7 (28)	7 (58.3)	0 (0)
>= 28	18 (72)	5 (41.7)	13 (100)
Chemotherapy			
Yes	18 (72)	9 (75)	9 (69.2)
No	7 (28)	3 (25)	4 (30.8)
Laser therapy			
Yes	16 (64)	6 (50)	10 (76.9)
No	9 (36)	6 (50)	3 (23.1)
Motives to pause the treatment			
No pause	12 (48)	8 (66.7)	4 (30.8)
Dehydration	1 (4)	1 (8.3)	0 (0)
Malnutrition	4 (16)	0 (0)	4 (30.8)
Chemotherapy side effects	1 (4)	1 (8.3)	0 (0)
Mucositis	2 (8)	0 (0)	2 (15.4)
Other causes	5 (20)	2 (16.7)	3 (23)
Oral Nutritional Therapy			
Yes	12 (48)	6 (50)	6 (46.2)
No	13 (52)	6 (50)	7 (53.8)
Feeding pathway in the end of the treatment			
Oral	10 (40)	5 (41.7)	5 (38.5)
Nasoenteral probe	11 (44)	5 (41.7)	6 (46.2)
Oral + nasoenteral probe	3 (12)	2 (16.6)	1 (7.7)
Gastrostomy	1 (4)	0 (0)	1 (7.7)

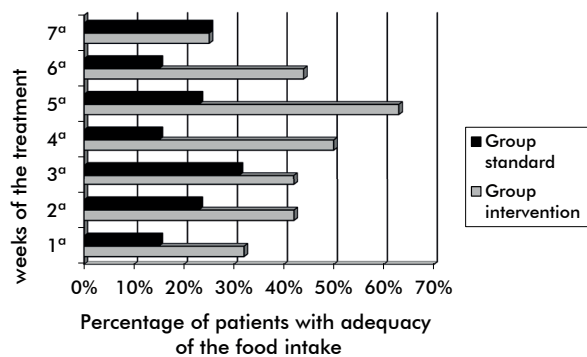
Table 2. Comparison of the loss of anthropometric measures in the end of the radiotherapy treatment

Variable	Group	N	Mean Difference	Standard-Deviation	Value of p*
Variation of weight (kg)	GI	12	- 1.89	± 2.58	0.017
	GP	13	- 9.92	± 6.68	
Variation of BMI (Kg/m ²)	GI	12	- 0.70	± 0.91	0.017
	GP	13	- 3.45	± 2.47	
Loss of calf circumference or brachial (cm)	GI	12	- 1.60	± 1.45	0.371
	GP	13	- 2.75	± 2.48	

Table 3. Comparison of the categories of PG-SGA in the two groups in the beginning and end of the radiotherapy treatment

Patient-generated Subjective Global Assessment						
	A		B		C	
Group	Beginning Ttm	Final Ttm	Beginning Ttm	Final Ttm	Beginning Ttm	Final Ttm
GI	83.3% (10)	41.7% (5)	16.7% (2)	58.3% (7)	0	0
GP	69.2% (9)	23.1% (3)	23.1% (3)	69.2% (9)	7.7% (1)	7.7% (1)

Captions: GI: group intervention; GP: group standard; Ttm: treatment; p-value for Fischer exact test >0.05.

**Figure 1.** Chart with the percentage of patients with adequacy of caloric food intake in every week of treatment

Caption: p-value for Fischer exact test >0.05.

chronic systemic symptoms after the end of the treatment as neurocognitive dysfunction, mood disorders, thermal discomfort, sweating, gastrointestinal symptoms and sleeping disorders¹¹.

This clinical trial had as main object to compare the results related to the nutritional status of a standard nutritional consultation that happens once a week with daily nutritional consultation for patients with tumors located in the head, neck and esophagus in radiotherapy treatment since these patients represent a risk group for malnutrition¹².

A clinical trial conducted in a Helsinki Hospital, in Finland, had similar design and objectives of the present study where oncologic patients of head, neck and esophagus were randomized with intervention of nutritional counseling in four moments of the

radiotherapy treatment compared to the standard attendance of one moment of nutritional counseling during radiotherapy¹³.

When compared the weight loss of the groups GI and GS, there was no statistical significance ($p = 0.017$), which was similar to the Helsinki study, where there was no statistical difference between the groups ($p=0.690$); however, the mean of weight loss was smaller for GI when compared to GS and to other studies. In a study conducted in Edmonton, Canada, the mean weight loss in patients with head, neck, esophagus cancer in radiotherapy treatment was 7.1 Kg¹⁴. Another clinical trial in a tertiary hospital in Australia introduced prophylactic gastrostomy and performed nutritional intervention before the beginning of the radiotherapy treatment and, in the end, did not obtain significant results in weight loss¹⁵. The study reports that a portion of the patients did not follow the nutritional orientations and decided for a low volume diet than what was prescribed.

Patients with higher initial BMI had more weight loss (initial mean of 30.3 Kg/m² and final mean of 26.9 Kg/m² compared to patients with lower BMI that had initial mean of 22.1 Kg/m² and final mean of 20.9 Kg/m²). This result corroborates the studies conducted in Helsinki and Edmonton. This last evaluated by tomography the loss of muscle mass that showed greater loss of lean mass in individuals with bigger BMI. These results alert for a possible occurrence of sarcopenia in these patients, which can signify more aggravated inflammatory status and worst post-treatment prognosis^{16,17}. In this clinical trial, the verification of mean mass was not possible through images. However, the measures of brachial circumference were

monitored (for patients <60 years) and calf (for patients ≥60 years) that, regardless of not generating significant results when compared, showed a gradual reduction of these measures. This can show that a simple instrument, a metric tape, can be used to identify the reduction of the patients' circumferences, being one more way of monitoring the body composition.

Similarly to the Helsinki study, this study utilized the PG-SGA to evaluate the symptoms and nutritional status that demonstrated, in the end of the treatment, the classification A – good nutritional status – in 41.7% of the patients of GI and 15% of the total patients in the current study and in the Helsinki, respectively. In relation to interruptions of the radiotherapy treatment, 66.7% of the patients of the GI of this study concluded the treatment without interruptions, compared to 30% of the individuals of GS and to 92% of the sample of the Helsinki clinical trial.

The symptoms that follow the patient since the beginning of the treatment, already present in the pre-diagnosis, can be complication factors in the course of the treatment to maintain the body mass and good nutritional status. Dysphagia is one of the pre-treatment symptoms commonly reported¹⁸. It happens as a result of the abnormalities of the structure or function of the anatomy involved in deglutition, having stenosis as the most common finding. Complications resulting from dysphagia as risk of aspiration, xerostomia, odynophagia and weight loss can be the main factors that lead the patient to reduce the tolerance to the treatment, potentially reflecting mainly in the caloric-protein intake, body composition and capacity of action of the immune system^{19,20}.

In relation to the patients' energetic necessities of the present study, during five weeks of the treatment, more than 40% of the patients reached the proper caloric value, with oral intake and use of ONT or ENT. Two adjustments realized frequently were temperature and consistency of the diet. The patients were guided about different compositions of menus for balance of nutrients in the proper consistency at each moment of the treatment; and in the case of ENT, time and volume of the infusion were reaffirmed and managed according to the response to the treatment and energetic necessities. In comparison, the prophylactic gastrostomy was initiated with the radiotherapy treatment in the Helsinki patients and in the experimental group, 12% of the patients reached >90% of the energetic necessities. The study reports that 69% of the patients presented difficulties in following the nutritional treatment planned because of adverse symptoms as nausea and anorexia. Kabarriti et al.²¹ reported that patients with larynx and oropharynx cancer in radiotherapy treatment apparently have better results of survival and progression

of the disease when they adhere to nutritional therapy²¹. Cereda et al.²² randomized a group of patients with head, neck and esophagus cancer in radiotherapy treatment with nutritional counseling and ONT and the results were growth of caloric intake, maintenance of body weight and better tolerance of the treatment²².

In the current clinical trial, the transit of the patients living in other cities until they reached the radiotherapy treatment appears to be a reducing factor of food intake, because, in some cases, the individual failed to carry its meal or the diet vial and fasted for a long period, even with the daily orientation of enteral or oral diet at the prescribed times. Another factor that appeared to reduce the food intake was the occurrence of constipation mainly caused by the use of morphine where the patient reported it felt satiated and did not eat. Nevertheless, the difficulty in following the nutritional therapy may have not been noticed in GI because of the daily frequency of nutritional counseling. Seemingly, the attendance to the laser therapy sessions favored more food intake in the days after the session, since the GI patients, for receiving daily nutritional counseling, were reminded of the importance of attending the laser therapy sessions in this same frequency. In addition, the placement of nasoenteral probe was initiated when 60% of the energetic necessities were not met and this may have favored a better adjustment of the caloric intake. Bortoletto et al.¹⁰ report in their study that 47.9% of the patients submitted to ENT did not lose weight after seven days of use until the end of the antineoplastic treatment¹⁰. van der Linden et al.²³, in a retrospective study, related significantly the bilateral cervix irradiation with the use of ENT suggesting this was an important factor for using enteral nutrition²³.

The daily nutritional counseling to the patients allowed, in addition to adjustment of the caloric intake, to verify whether there was proper intake of micronutrients and, if not, indicate nourishment sources that contained from one to two times the intake of micronutrients referred by the Dietary References Intake (DRI)^{7,24}. Nejatnamini et al.¹⁴ associated vitamin status with muscle mass and mucositis in patients with head, neck and esophagus cancer and found statistically significant results for values of vitamins A and D below the reference levels associated to mucositis. This association can be explained by the important function of these vitamins in maintaining the homeostasis in the mucosal barrier and in the modulation of immune responses¹⁴. In another study, where a group of patients with head and neck cancer received ONT and the other, did not, there was less occurrence of mucositis in the group that used ONT²⁵. These results can suggest that addressing the necessities of micronutrients, together with the caloric-protein intake

helps to minimize the occurrence of mucositis because it provides the organism with the necessary amount in the immune barriers.

The increased frequency of the nutritional consultation seems to be an important factor for the patient to understand the necessity of good nutritional status for the success of the radiotherapy treatment. The Guidelines of the Clinical Oncological Society of Australia about Nutrition of Head and Neck Cancer²⁶ indicate that the increase of intensity of dietary supervision leads to less weight loss, less interruptions of the treatment, less unplanned hospitalization and better transition to post-treatment oral diet²⁶. Other study conducted at University Hospital of Kobe in Japan with patients with oropharynx cancer in chemo-radiotherapy, in intensive nutritional therapy and use of percutaneous endoscopic gastrostomy revealed increase of the intake of calories, reduction of adverse effects and complete dosage of cisplatin, suggesting that the intensive nutritional support can contribute for better results in oncologic patients²⁷. In a longitudinal study in Taiwan with hospitalized oncologic patients, results showed that at least three nutritional consultations have effectively increased the intake of calories and preserved the body weight²⁸.

The study of the Helsinki Hospital suggests the nutritional intervention in the beginning of the treatment and in the third week and reports that the side effects of the radiotherapy usually appear. The onset of side effects happened similarly in the patients of this study in the third week of radiotherapy treatment. This was the period of greatest adjustment of caloric intake and indication of ENT, where the occurrence of mucositis, ageusia, dysphagia, odynophagia, anorexia and nausea aggravated the symptoms condition, which, until then, were absent in most of the patients. In another observational study, patients with head and neck cancer were followed up since the diagnosis until three months after the chemo-radiotherapy. Until the diagnosis, there was prevalence of malnutrition, after chemotherapy and nutritional intervention, the nutritional status improved. In the end of the radiotherapy, occurred a significant deterioration of the nutritional status²⁹. This result can suggest that, after the third week of radiotherapy, the patient becomes more susceptible to decline of the nutritional status as result of the aggravation of the symptoms, which can also be a consequence of the toxicity caused by the treatment. Concurring with these results, a retrospective study performed in India with patients of head and neck cancer in radiotherapy treatment showed that the individuals developed mucositis and dysphagia from the third week of the treatment³⁰. Pan et al.³¹ evaluated the nutritional status of patients with esophagus cancer

in chemo-radiotherapy and found prevalence of 83% of malnutrition, suggesting, with these results, the implementation of nutritional intervention in the radiotherapy sector³¹.

Because of this description, the nutritional follow-up can act early and help to favor lower rate of hospitalization or less time for the patient to use hospital services since malnutrition can be a predictive factor for unplanned hospitalization³²⁻³⁵.

The study presented some limitations that may have interfered in the results. The short period of application (6 months), the reduced number of participants (29) and the heterogeneity in the types of tumor – oral cavity and esophagus – were some of the limitative factors. In addition, the fact that it comprehended chemotherapy associated to radiotherapy and adjuvant and neoadjuvant treatments may also have interfered in the results.

The literature search about this subject showed that Brazil, compared with other countries, opens a wider space for the nutritionist action in the outpatient units and hospitals, which can signify more efficacy in the oncologic treatment, since the good nutritional status can mean great success of the treatment, mainly for favoring the improvement of the physiological and biochemical parameters of the organism.

CONCLUSION

The present study found significant results of reduced body weight loss of the patients with head, neck and esophagus cancer in radiotherapy treatment when counseled daily by a nutritionist. Compared to the outcomes of other studies, where nutritional counseling happens less frequently during the radiotherapy treatment, this study suggests that the daily follow up of patients with this profile can result in less body weight loss and improvement of the management of adverse symptoms because the nutritionist has more contact with the patient. The daily presence of a nutritionist in the radiotherapy sector allows better monitoring of the body composition, management of side effects and appropriateness of the caloric intake through adjustment of the consistency of the diet and type of oral food with ONT or ENT. These three factors appear to have been the main topics that favored the results of this study.

More studies are necessary with similar design to the current study, so more results can be compared. The joint analysis of daily nutritional counseling and early introduction of ENT can in the future, according to its results, be the precursors of guidelines that steer the professionals to specific conducts to the patients with this profile.

CONTRIBUTIONS

Sheila Cristina Pootz and Ana Carolina Pio da Silva participated of the planning, gathering, analysis and interpretation of data, wording and critical review. Dóris Gonçalves Boff participated of the planning and gathering of data. Raquel Canuto participated of the analysis and interpretation of the data. Janaína Brollo participated of the planning, gathering of the data and critical review. All the authors approved the final version for publication.

ACKNOWLEDGMENTS

To the Sector of Radiotherapy of the High Complexity Unit in Oncology of the General Hospital of Caxias do Sul for the space offered to the study and the collaboration through the access to the patients.

DECLARATION OF CONFLICT OF INTERESTS

There is no conflict of interests to declare.

FUNDING SOURCES

None.

REFERENCES

- Jemal A, Bray F, Center MM, et al. Global cancer statistics. *CA Cancer J Clin.* 2011;61(2):69-90. doi: <https://doi.org/10.3322/caac.20107>.
- Oliveira FP, Santos A, Viana MS, et al. Perfil nutricional de pacientes com câncer de cavidade oral em pré-tratamento antineoplásico. *Rev Bras Cancerol.* 2015;61(3):253-9. doi: <https://doi.org/10.32635/2176-9745.RBC.2015v61n3.255>
- Instituto Nacional de Câncer José Alencar Gomes da Silva. Inquérito brasileiro de nutrição oncológica. Rio de Janeiro: INCA; 2013.
- Gorenc M, Kozjec NR, Strojan P. Malnutrition and cachexia in patients with head and neck cancer treated with (chemo) radiotherapy. *Rep Pract Oncol Radiother.* 2015;20(4):249-58. doi: <https://doi.org/10.1016/j.rpor.2015.03.001>
- Hong JS, Wu LH, Su L, et al. Effect of chemoradiotherapy on nutrition status of patients with nasopharyngeal cancer. *Nutr Cancer.* 2016;68(1):63-9. doi: <https://doi.org/10.1080/01635581.2016.1115099>
- Gonzalez MC, Borges LR, Silveira DH, et al. Validação da versão em português da avaliação subjetiva global produzida pelo paciente. *Rev Bras Nutr Clin.* 2010;25(2):102-8.
- Instituto Nacional de Câncer José Alencar Gomes da Silva. Consenso nacional de nutrição oncológica. 2. ed. rev. ampl. atual. Rio de Janeiro: INCA; 2015.
- Miyake M, Morizawa Y, Hori S, et al. Integrative assessment of pretreatment inflammation-, nutrition-, and muscle-based prognostic markers in patients with muscle-invasive bladder cancer undergoing radical cystectomy. *Oncology.* 2017;93(4):259-69. doi: <https://doi.org/10.1159/000477405>
- Secombe P, Harley S, Chapman H, et al. Feeding the critically ill obese patient: a systematic review protocol. *JBI Database System Rev Implement Rep.* 2015;13(10):95-109. doi: <https://doi.org/10.11124/jbisrir-2015-2458>
- Baracos VE, Martin L, Korc M, et al. Cancer-associated cachexia. *Nat Rev Dis Primers.* 2018;4:17105. doi: <https://doi.org/10.1038/nrdp.2017.105>
- Bortoletto MM, Souza IA, Dias AMN, et al. Perfil sociodemográfico e nutricional de pacientes oncológicos em terapia nutricional enteral. *Rev Bras Cancerol.* 2018;64(2): 141-7. doi: <https://doi.org/10.32635/2176-9745.RBC.2018v64n2.72>
- Wulff-Burchfield E, Dietrich MS, Ridner S, et al. Late systemic symptoms in head and neck cancer survivors. *Support Care Cancer.* 2019;27(8):2893-2902. doi: <https://doi.org/10.1007/s00520-018-4577-3>
- Orell H, Schwab U, Saarilahti K, et al. Nutritional counseling for head and neck cancer patients undergoing (chemo) radiotherapy: a prospective randomized trial. *Front Nutr.* 2019;6:22. doi: <https://doi.org/10.3389/fnut.2019.00022>
- Nejatinamini S, Debenham BJ, Clugston RD, et al. Poor vitamin status is associated with skeletal muscle loss and mucositis in head and neck cancer patients. *Nutrients.* 2018;10(9):E1236. doi: <https://doi.org/10.3390/nu10091236>
- Brown TE, Banks MD, Hughes BGM, et al. Randomised controlled trial of early prophylactic feeding vs standard care in patients with head and neck cancer. *Br J Cancer.* 2017;117(1):15-24. doi: <https://doi.org/10.1038/bjc.2017.138>
- Fattouh M, Chang GY, Ow TJ, et al. Association between pretreatment obesity, sarcopenia, and survival in patients with head and neck cancer. *Head Neck.* 2019;41(3):707-14. doi: <https://doi.org/10.1002/hed.25420>
- Grotenhuis BA, Shapiro J, van Adrichem S, et al. Sarcopenia/muscle mass is not a prognostic factor for short- and long- term outcome after esophagectomy for cancer. *World J Surg.* 2016;40(11):2698-2704. doi: <https://doi.org/10.1007/s00268-016-3603-1>
- Righini CA, Timi N, Junet P, et al. Assessment of nutritional status at the time of diagnosis in patients treated for head and neck cancer. *Eur Ann Otorhinolaryngol Head Neck Dis.* 2013;130(1):8-14. doi: <https://doi.org/10.1016/j.anor.2012.10.001>

19. Langius JAE, Bakker S, Rietveld DHF, et al. Critical weight loss is a major prognostic indicator for disease-specific survival in patients with head and neck cancer receiving radiotherapy. *Br J Cancer*. 2013;109(5):1093-99. doi: <https://doi.org/10.1038/bjc.2013.458>
20. Riffat F, Gunaratne DA, Palme CE. Swallowing assessment and management pre and post head and neck cancer treatment. *Curr Opin Otolaryngol Head Neck Surg*. 2015;23(6):440-7. doi: <https://doi.org/10.1097/MOO.0000000000000205>
21. Kabarriti R, Bontempo A, Romano M, et al. The impact of dietary regimen compliance on outcomes for HNSCC patients treated with radiation therapy. *Support Care Cancer*. 2018;26(9):3307-13. doi: <https://doi.org/10.1007/s00520-018-4198-x>
22. Cereda E, Capello S, Colombo S, et al. Nutritional counseling with or without systematic use of oral nutritional supplements in head and neck cancer patients undergoing radiotherapy. *Radiother Oncol*. 2018;126(1):81-8. doi: <https://doi.org/10.1016/j.radonc.2017.10.015>
23. van der Linden N, Kok A, Leermarkers-Vermeer MJ, et al. Indicators for enteral nutrition use and prophylactic percutaneous endoscopic gastrostomy placement in patients with head and neck cancer undergoing chemoradiotherapy. *Nutr Clin Pract*. 2016;32(2):225-32. doi: <https://doi.org/10.1177/0884533616682684>
24. Institute of Medicine (US). Dietary reference intakes for calcium and vitamin D. Washington, DC: The National Academies Press; 2011. doi: <https://doi.org/10.17226/13050>
25. Bicakli DH, Akagunduz OO, Dalak RM, et al. The effects of compliance with nutritional counselling on body composition parameters in head and neck cancer patients under radiotherapy. *J Nutr Metab*. 2017;2017:8631945. doi: <https://doi.org/10.1155/2017/8631945>
26. Findlay M, Bauer J, Brown T; Head and Neck Guideline Steering Committee. Does nutrition intervention improve outcomes?. In: Head and Neck Guideline Steering Committee. Evidence-based practice guidelines for the nutritional management of adult patients with head and neck cancer [Internet]. Sydney: Cancer Council Australia; [2011]. [modified 2016 April 17; cited 2019 Apr 5]. Available from: <https://wiki.cancer.org.au/australiawiki/index.php?oldid=132288>
27. Takahashi M, Kosaka N, Wakui E, et al. Role of intensive nutrition support and prophylactic percutaneous endoscopic gastrostomy during concomitant chemoradiotherapy for oropharyngeal cancer. *Int J Clin Oncol*. 2018;23(6):1023-28. doi: <https://doi.org/10.1007/s10147-018-1328-x>
28. Yang YC, Lee MS, Cheng HL, et al. More frequent nutrition counseling limits weight loss and improves energy intake during oncology management: a longitudinal inpatient study in Taiwan. *Nutr Cancer*. 2019;71(3):452-60. doi: <https://doi.org/10.1080/01635581.2018.1516791>
29. 29 – Arribas L, Hurtós L, Taberna M, et al. Nutritional changes in patients with locally advanced head and neck cancer during treatment. *Oral Oncol*. 2017;71:67-74. doi: <https://doi.org/10.1016/j.oraloncology.2017.06.003>
30. Muzumder S, Srikantia N, Udayashankar AH, et al. Burden of acute toxicities in head-and-neck radiation therapy: a single-institutional experience. *South Asian J Cancer*. 2019;8(2):120-3. doi: https://doi.org/10.4103/sajc.sajc_264_17
31. Pan P, Tao G, Sun X. Subjective global assessment and prealbumin levels of esophageal cancer patients undergoing concurrent chemoradiotherapy. *Nutr Hosp*. 2015;31(5):2167-73. doi: <https://doi.org/10.3305/nh.2015.31.5.8596>
32. Agarwal E, Ferguson M, Banks M, et al. Malnutrition and poor food intake are associated with prolonged hospital stay, frequent readmissions, and greater in-hospital mortality: results from the nutrition care day survey 2010. *Clin Nutr*. 2013;32(5):737-45. doi: <https://doi.org/10.1016/j.clnu.2012.11.021>
33. Bahig H, Fortin B, Alizadeh M, et al. Predictive factors of survival and treatment tolerance in older patients treated with chemotherapy and radiotherapy for locally advanced head and neck cancer. *Oral Oncol*. 2015;51(5):521-28. doi: <https://doi.org/10.1016/j.oraloncology.2015.02.097>
34. Chen F, Fang J, Wang H, et al. Effects of nutritional support on short-term clinical outcomes and immune response in unresectable locally advanced oesophageal squamous cell carcinoma. *Eur J Cancer Care (Engl)*. 2018;27(2):e12818. doi: <https://doi.org/10.1111/ecc.12818>
35. Cong MH, Li SL, Cheng GW, et al. An interdisciplinary nutrition support team improves clinical and hospitalized outcomes of esophageal cancer patients with concurrent chemoradiotherapy. *Chin Med J (Engl)*. 2015;128(22):3003-7. doi: <https://doi.org/10.4103/0366.6999.168963>

Recebido em 30/9/2019
Aprovado em 28/2/2020