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Research Article

Radiotherapy Symptoms in Head and Neck Cancer Patients in Northeast Brazil

*Luana Mota de Jesus, Vanessa Souza Gois, Isis Valéria Lima de Oliveira, Monna Lisa Nascimento Wine de Oliveira, Gabriele Souza de Oliveira, Aracely Santos Horta and Priscila Feliciano de Oliveira**

Federal University of Sergipe, São Cristóvão, Sergipe, Brazil

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ABSTRACT

Objective: To describe the symptoms of radiotherapy in head and neck cancer patients and the time of initial onset of those.

Material and Methods: All ethical precepts were followed, and the present study was approved by CEP number 92772318.8.0000.5546. The data collection in 41 head and neck cancer patients were performed by applying a questionnaire adapted by the researchers based on the EORTC QLQ-H & N35 protocol. The questionnaire consisted of 19 closed questions focusing on the adverse effects of radiotherapy.

Results: Most participants were male, with laryngeal cancer being the one with the highest incidence. Among the deleterious symptoms, the ones with more occurrence were weight loss, xerostomia, dysphagia and use of catheters. They appeared at the beginning of treatment, between the 6th and 10th session of radiotherapy. Symptoms such as social/family difficulties and oral communication had been present since the beginning of the treatment, extending to those who had completed the therapeutic procedure.

Conclusion: Adverse symptoms are common in patients undergoing radiotherapy treatment for head and neck cancer, and mostly include aspects related to the eating process with involvement at the beginning of the treatment.

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Introduction

Head and neck cancer is highly prevalent and, in developing countries like Brazil, its diagnosis occurs late. As it encompasses oral cavity cancers, patients are often at high risk for malnutrition. This type of neoplasm affects the various anatomical sites, with approximately 40% occurring in the oral cavity and 20% in the larynx. It is the second most prevalent type of malignant tumor in males, with the larynx occupying the first place of head and neck neoplasms, being more prevalent in men over 40 years [1-4]. Although the decrease in tobacco use in Brazil was significant from 1989 (34.8%) to 2003 (22.4%), it is still considered one of the etiologies of HNC [5]. Studies report that about 60% of the population affected by this cancer are severely dependent on nicotine [6]. Besides, excessive alcohol use is also a cause, as well as poor oral hygiene and HPV habits [1].

The search for cure and improvement in the quality of life of these patients has been the target of studies based on technological advances. It allowed a significant increase in scientific research in the field of oncology. One of the recommended treatment methods for patients with CNH is radiotherapy. This procedure involves the use of ionizing radiation in the tumor location to eliminate malignant cells. However, radioactive action is not restricted to tumor cells only, since the main field to be irradiated is contemplated by the predetermined dose, while neighboring cells receive a smaller amount of irradiation [1]. During radiotherapy treatment, despite advances in the area regarding the planning and isolation of organs such as eyes and ear, patients may develop alterations and sequelae due to radiotoxicity, such as: hearing impairment, osteoradionecrosis, xerostomia, vocal alteration, difficulty in swallowing (dysphagia), mucositis, alteration or loss of taste (hypogeusia and dysgeusia) and trismus. It is known that these directly affect the quality of life of patients, which can further aggravate the clinical condition [4, 7, 8].

*Correspondence to: Priscila Feliciano de Oliveira, Ph.D., Department of Speech, Language and Hearing Sciences, Federal University of Sergipe, Marechal Rondon Avenue, s/n. São Cristóvão, Sergipe, Brazil, 49100-000; Tel: +557931946805/+5579991312569; E-mail: oliveiraprisila@hotmail.com

The literature reports that adverse effects are more reported in the first month of the therapeutic procedure, and are accompanied by emotional signs such as irritability, fear, sadness, and nervousness. However, the effects of radiotherapy may also arise over the long-term, as they last or appear years after the end of the treatment. Most of the research, which encompasses these findings, is conducted in first world countries, which is different when compared to Brazil. Thus, researching the signs and symptoms of treatment, allied to the time of involvement, allows the knowledge of the population served to provide a humanized approach regarding pre-radiotherapy information to guide the patient even before the symptoms appear [9, 10]. Thus, the objective of this study is to describe the deleterious symptoms of radiotherapy in patients with head and neck cancer and the time of the initial onset of these symptoms.

Material and Methods

This is a cross-sectional cohort study of analytical and survey features. All ethical precepts were followed, and the study got its approval by the Research Ethics Committee under the number 92772318.8.0000.5546. The data collection was performed from November 2018 to August 2019 in the radiotherapy sector of a public hospital. The sample consisted of 41 subjects and all participants underwent 3D radiotherapy treatment, with a mean total dose of 70Gy, using the Varian Clinac® HCX6272 accelerator. The inclusion of participants in the study had the following criteria:

- Patients diagnosed with head and neck cancer;
- Individuals undergoing radiotherapy treatment or who had already completed the therapeutic procedure within 03 months.

Among the exclusion criteria were: subjects who only underwent surgery and/or chemotherapy; who presented psychiatric problems; who did not demonstrate stable clinical aspects capable of establishing verbal or nonverbal communication; and metastasized individuals.

The data collection material was a questionnaire that was based on the EORTC QLQ-H & N35 protocol (specific for HNC) elaborated by the European Organization for Research and Treatment of Cancer Quality of Life, validated by Bjordal et al (1999). Therefore, the researchers adapted the questionnaire and it consisted of 19 closed questions focusing on the adverse effects of radiotherapy on head and neck cancer. The participants were asked to answer the questionnaire, and the questionnaire application took place in a quiet room, individually. The answers to each item could be yes or no. In the case of a positive answer, the patient informed from which session the symptom was perceived; and, if the treatment finished, he was asked if the symptom persisted after that. When the patient was tracheostomized or when the tumor was located in the region of the face or mouth, the application time was longer, since the patient presented difficulties in oral communication. In these cases, the researchers asked the patient to move with the head to the right and left indicating 'no' and up and down indicating 'yes' and concerning the session number, the patient did the corresponding numbering with the fingers.

The statistical analysis considered as a fixed factor the presence of deleterious symptoms and random factors, the type of head and neck cancer, and the time of symptom onset. The tests were processed by the Statistical Package for Social Science version 20 (SPSS, Chicago, USA). The critical level was set at 5% ($P < 0.05$) to allow a mean difference as

statistically significant. In the descriptive analysis, data were expressed as mean \pm standard deviation values. For comparison between the two groups, under the influence of a single variation factor, Chi-Square was performed.

Results

The average age of the participants was 56.93 (± 14.51) years, with males being more prevalent (68.3%). Among the professional activities, the ones with higher occurrence were 'retired' (31.7%) and 'rural workers' (29.3%). Regarding education, 48.8% reported not having completed elementary school and 26.8% were illiterate. Also, 65.9% lived in countryside cities during treatment.

Among the CNH sites, the larynx was the one with the highest incidence, as described in Table 1.

Table 1: HNC sites of the study population (n=41).

HNC Site	Percentage
Larynx	41,5
Esophagus	9,8
Tongue	4,9
Nose	4,9
Face	7,3
Mouth	19,5

Regarding the use of tracheostomy, 43.9% of the patients were using this device, being more prevalent in laryngeal cancer (76.5%).

Radiotherapy treatment was completed with an average of 32 (± 5.17) sessions. Thus, the beginning of the treatment was considered when the patient had completed at least 10 sessions; those who were in the middle of the therapeutic procedure performed approximately 20 sessions, and, at the end of the treatment, 30 sessions. Thus, Table 2 elucidates the post-radiotherapy symptoms related to the session in which the symptom appeared.

Discussion

Most of the participants who presented HNC were male. This data also is reported by the current literature [10, 11]. It can be explained by the high prevalence of tobacco use in the male population, in which, despite a significant reduction in recent years, smoking is still considered one of the main etiologies of HNC [1, 12]. Most of the studied population presented a low education level since they were illiterate or did not complete elementary school. Studies in the area elucidate the relationship between low educational level and difficulty in accessing health services. They are subjects who mostly have little information about head and neck cancer, which delays the diagnosis, making it difficult to choose proper treatment, since cancer is often already advanced. Allied to these questions, the subjects present difficulties in understanding the guidelines of the oncology medical team. These data elucidate the need to broaden the communication strategies of health teams, to provide more information to the population with low education [13].

Table 2: Symptoms after radiotherapy in patients with HNC (n = 41) according to the time of involvement (number of sessions). Statistical analysis: Chi-square. Values expressed as percentage (n) (*) p <0.05 and (**) p <0.01.

ADVERSE SYMPTOMS	% (n)	Session average (days) (± SD)	Beginning of the treatment (p value)	Finished Treatment (p value)
Weight Loss	82,9(35)	7,46(7,35)	-	**
Xerostomia	75,6(31)	6,06(8,92)	-	-
Hoarseness	65,9(27)	6,52(6,67)	-	-
Difficulty in solid/pasty swallowing	56,1(23)	6,67(7,30)	-	-
Use of catheter	53,7(21)	10,43(11,25)	-	-
Difficulty in liquid swallowing	53,7(22)	10,41(10,20)	*	-
Sore throat	51,2(22)	9,33(8,67)	-	-
Trismus	48,8(20)	11,10(9,8)	*	-
Hair Loss	46,3(19)	6,47(6,85)	-	-
Mouth pain	43,9 (18)	7,17 (7,02)	-	-
Mouth irritation	41,5(17)	7,76(9,37)	-	-
Chocking	43,9(18)	5,06(5,52)	-	-
Smell decrease	36,6(15)	7,73(10,50)	-	-
Jaw pain	34,1 (14)	6,36(8,65)	-	*
Teeth problem	22,0(08)	3,88(6,55)	-	**
Difficulty in Hearing	22,0(10)	8,4(12,16)	*	-
Difficulty in talking on the phone	19,5(08)	4,13(4,58)	-	**
Difficulty in family life	7,3(08)	8,0(10,44)	*	**

Choking was observed, and all subjects with this discomfort reported difficulty in swallowing liquid (p = 0.000) and solid/pasty (p = 0.001) (Chi-square statistical analysis).

According to data from *EMDAGRO* (Sergipe Agricultural Development Company), the state highlights rural activities as the main source of family income. In this research, there was a predominance of rural workers. Regarding this work activity, it is observed that individuals are often exposed to solar radiation and chemical agents, such as pesticides. These contribute to the onset of cancer [14]. According to INCA statistics, the number of cancer cases is increasing over the years, and this is a disease considered a public health problem. Concerning head and neck cancer, the focus of the present research estimates for 2018/2019 is 7,000 new cases of laryngeal cancer in Brazil. This data elucidates the findings of the present study since a larger number of cases of laryngeal cancer was found, among those with head and neck, followed by mouth [11].

The hyper fractional radiotherapy treatment was the basis of the treatment of the present research patients, and, in most cases, the treatment lasted approximately one month, and the subjects underwent daily sessions. Although therapeutic planning is fractional, patients reported changes in functional aspects since the beginning of treatment. The findings were consistent with the literature, since adverse effects such as tinnitus, hearing and weight loss, trismus, osteoradionecrosis, xerostomia, dysphagia, vocal alteration, mucositis, hypogeusia, dysgeusia are common, which compromises the quality of the patients' life [1, 15]. In this study, 82.9% of the individuals were diagnosed with weight loss, which starts at the beginning of the treatment but extends to those who have already completed radiotherapy, corroborating the literature data. Studies have also related the increase in weight loss in patients undergoing concomitant chemotherapy even after the end of treatment, with a 5% loss of body mass [16, 17].

One of the factors that lead to a decrease in body weight is the reduction/absence of taste and/or smell, which results from radiation in the receptors responsible for these sensations. In the present study, 36.6% of patients reported difficulty in smell. Affected subjects lose their desire for food, which in turn affects nourishment, leading to mild malnutrition or severe malnutrition, affecting the physical and psychological state of the individual [17, 18]. It is also observed that the decrease in taste occurs due to the alteration of salivary glands, common in radiotherapy treatment. There is a decrease in sensitivity, as the glands, when struck, suffer a transient or permanent hypofunction, which is dependent on the period and amount of radiation projected in the region. Consequently, there is a decrease in saliva, called xerostomia, which is present in 75.6% of the present study and is reported in the literature as a late complication [16].

Another prevalent symptom related to those previously mentioned is sore throat (51.2%), which presents itself almost conjointly with decreased taste, which consequently leads to decreased saliva in the region, causing severe pain. Such findings in the present research have a high incidence and the literature reports that one adverse effect may trigger the others [19]. The difficulty in eating, also called dysphagia, results from anatomical changes and fibrosis due to radiation effects in the region. The subjects are often submitted to resection of regions of high functional and anatomical importance for the swallowing process. The individuals who are mainly affected by oral cavity cancer have more difficulties since there is a loss of sensitivity and/or anatomical parts. Thus, in the present study, the difficulty in swallowing liquid was present in 53.7% and solid/pasty in 56.1% — demonstrating the real difficulty that is reported — which were affected by this adverse effect, respectively, in the middle and at the beginning of treatment. Dysphagia is believed to be one of the effects of previously reported symptoms such

as xerostomia, decreased taste/smell as well as pain in the oral region. Thus, the use of a catheter in 53.7% of the participants reaffirms the difficulty in swallowing, since the literature reports that its use is one of the most effective means to adjust the nutritional status of the patient, to prevent weight loss [20, 21].

Another common complaint in the present study was hoarseness. Approximately 70% of the subjects reported vocal alteration in the first sessions of HNC treatment, which corroborates the current literature. Studies report that mainly subjects with laryngeal cancer are affected by mild or other vocal alterations require intense speech therapy, due to physiological or anatomical limitations [20]. Besides, from the total of laryngeal cancer patients, there was a predominance of participants using tracheostomy. This is a common practice, as the device allows regulation of the upper airways, which in laryngeal cancer are affected by cancer cells. Thus, this is a means of providing satisfactory respiratory support to the patient, but, as adverse effects, oral communication is hindered [22, 23].

All adverse effects related to treatment toxicity lead to a decrease in the quality of life of these patients, which, in the present study, reported difficulty in family life, as did the subjects who had completed the treatment. This social/family problem may occur due to the difficulty of oral communication, the presence of hearing loss and difficulty in the feeding process, symptoms that were reported by patients. Besides, studies report that symptoms and factors, such as difficulty in understanding the prognosis of the disease, end up aggravating the emotional aspect, as it generates fear and insecurity. It is of great importance to work with a multidisciplinary team to minimize the adverse effects of radiotherapy as well as provide emotional and social support to improve the quality of life of these patients.

Conclusion

The HNC affects the male population more, being the most frequent one the larynx. Among the most common adverse effects were weight loss, xerostomia, hoarseness, dysphagia, catheter use, and laryngeal pain. Symptom onset was described from the first weeks of treatment (up to the tenth session).

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