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SEVERE RADIODERMATITIS AND RISK FACTORS ASSOCIATED IN HEAD AND NECK CANCER PATIENTS

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ABSTRACT

Objective: to evaluate the association between sociodemographic, clinical, and treatment factors in the outcome of severe radiodermatitis in patients with head and neck cancer seen at the nursing consultation; and to analyze the impact of severe radiodermatitis cases on therapeutic follow-up.
Method: a quantitative, documentary research conducted with medical records of 167 patients with head and neck cancer submitted to radiotherapy with curative indication followed in the nursing consultation in 2016. A structured form was used for data collection and analytical and descriptive statistics were used for its analysis.
Results: of the 99.4% patients who had radiodermatitis, 11.4% were severe cases. Severe radiodermatitis was associated with the type of equipment, treatment technique and presence of comorbidities. Of the patients who presented grade three, 53% had temporary discontinuation of treatment.
Conclusion: head and neck cancer patients who undergo radiotherapy with curative indication are at risk for severe radiodermatitis. Nursing consultation is important to minimize the severity of this event and the reduction of temporary treatment interruption due to this adverse reaction.

DESCRIPTORS: Radiodermatitis. Risk factors. Nursing care. Oncology nursing. Head and neck neoplasms.

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RADIODERMATITE SEVERA E FATORES DE RISCO ASSOCIADOS EM PACIENTES COM CÂNCER DE CABEÇA E PESCOÇO

RESUMO

Objetivo: avaliar a associação entre os fatores sociodemográficos, clínicos e do tratamento no desfecho de radiodermatite severa em pacientes portadores de câncer de cabeça e pescoço atendidos na consulta de enfermagem; e analisar o impacto dos casos de radiodermatite severa no seguimento terapêutico.
Método: pesquisa quantitativa, documental, realizada com prontuários de 167 pacientes com câncer de cabeça e pescoço submetidos à radioterapia com indicação curativa acompanhados na consulta de enfermagem no ano de 2016. Utilizou-se um formulário estruturado para a coleta de dados e empregou-se estatística analítica e descritiva para sua análise.
Resultados: dos 99,4% pacientes que tiveram radiodermatite, 11,4% foram severas. A radiodermatite severa se associou ao tipo de aparelho, técnica de tratamento e presença de comorbidades. Dos pacientes que apresentaram grau três, 53% tiveram suspensão temporária do tratamento.
Conclusão: pacientes com câncer de cabeça e pescoço que fazem radioterapia com indicação curativa apresentam risco para radiodermatite severa. A consulta de enfermagem é importante para minimizar a severidade deste evento e a diminuição da interrupção temporária do tratamento por esta reação adversa.

DESCRITORES: Radiodermatite. Fatores de risco. Cuidados de enfermagem. Enfermagem oncológica. Neoplasias de cabeça e pescoço.

RADIODERMATITIS GRAVE Y FACTORES DE RIESGO ASOCIADOS EN PACIENTES CON CÁNCER DE CUELLO Y CABEZA

RESUMEN

Objetivo: evaluar la asociación entre los factores sociodemográficos, clínicos y de tratamiento en los resultados de la radiodermatitis grave en pacientes con cáncer de cuello y cabeza atendidos en una consulta de enfermería, además de analizar el efecto de los casos de radiodermatitis grave sobre el seguimiento terapéutico.
Método: investigación cuantitativa y documental realizada con expedientes médicos de 167 pacientes con cáncer de cuello y cabeza sometidos a radioterapia con prescripción de cura, con seguimiento en consulta de enfermería en el año 2016. Se utilizó un formulario estructurado para recolectar los datos y se empleó analítica estadística para su análisis.
Resultados: del 99,4% de los pacientes que tuvieron dermatitis, el 11,4% de los casos fueron graves. La radiodermatitis grave se asoció al tipo de dispositivo, técnica de tratamiento y presencia de comorbidades. De los pacientes que presentaron el grado 3, el 53% suspendió temporariamente el tratamiento.
Conclusión: los pacientes con cáncer de cuello y cabeza que se someten a radioterapia con prescripción de cura presentan cierto riesgo de radiodermatitis grave. La consulta de enfermería es importante para minimizar la gravedad de este evento y para reducir el índice de interrupción temporaria del tratamiento a raíz de esta reacción adversa.

DESCRIPTORES: Radiodermatitis. Factores de riesgo. Cuidados de enfermería. Enfermería oncológica. Neoplasias de cuello y cabeza.

INTRODUCTION

Radiotherapy is one of the modalities of choice for cancer treatment and, despite advances in radiation techniques, patients still have acute reactions that may compromise the curative indication of treatment[1] and the quality of life.[2] Skin reactions are the most common, as evidence shows that 93% of the radiotherapy cancer patients develop this type of adverse reaction,[3] referred to herein as radiodermatitis.

Radiodermatitis is a toxic effect of radiation, classified as acute, when toxicity arises during treatment or up to three months after completion, characterized by: initial erythema, progressive edema, hyperchromia, dry or wet flaking, ulceration or bleeding; and as chronic, which appears three months to years after the end of treatment, and has as signs: ischemia, pigmentary changes, thickening, telangiectasia, ulceration and fibrosis.[4]

In patients with head and neck cancer, the development of radiodermatitis is more common, due to the location of the treatment field, the region being a folding area, and the possibility of the presence of the tracheostomy tube, which causes constant humidity and friction, both considered risk factors. In addition, the unfavorable nutritional status, recurrent in these patients, may lead to the risk of poor wound healing.[5]

On the frequency of radiodermatitis in this population, in a Swiss study that raised the acute toxicities presented by 72 patients with head and neck cancer submitted to curative indication Modulated Intensity Radiotherapy, the results showed that the highest percentages were dysphagia (53%), radiodermatitis (44%) and mucositis (32%), and 84% of patients discontinued radiotherapy for these toxicities.[6]

The evolution of radiodermatitis is identified by the use of scales to evaluate the skin, being the most used the *Radiation Therapy Oncology Group* (RTOG) of the *European Organization for Research and Treatment of Cancer*, and of the *Common Terminology Criteria for Adverse Events* (CTCAE) of the *National Cancer Institute*, with grades ranging from zero to five in increasing order of toxicity.[7]

In these skin assessment scales, grade three is classified as severe radiodermatitis, which is characterized by confluent wet flaking beyond the areas of skin folds and intense edema.[8] When grade three occurs, there is a need to give medical advice as to whether treatment should be continued, i.e., whether it should be discontinued temporarily until the lesion is reduced or fully healed.

Such interruption may compromise local disease control and reduce cure rates in patients who treat head and neck and other topographies.[1] In addition, a study with head and neck cancer patients associated severe radiodermatitis as a predictor of late fibrosis reaction.[9]

In a review study of the factors associated with the quality of life of patients with radiodermatitis, the authors concluded that there are impairments in the quality of life of these patients, mainly due to pain, pruritus, altered body image and the presence of anxiety and depression symptoms.[2] Such damage adds to cancer's own impact on quality of life, especially in the domains of physical and cognitive function.[10]

Therefore, prevention and control of these effects is fundamental, as they influence the conduction and adherence to treatment and even the survival of patients. Based on this understanding, the nurse plays an important role in the education of the patients in radiotherapy treatment and in the management of these reactions which can constitute a potential harm.

By means of the nursing consultation, the nurse guides the individual on general treatment issues, such as the action of radiotherapy, and on specific issues, such as care in the irradiated area to minimize skin reactions. In addition, he evaluates the area and toxicity of the irradiated tissues using the assessment scales, prescribing products to treat the lesion according to the observed skin reaction.[11]

A systematic review showed that 50% of the selected studies reported benefits to head and neck cancer patients from the application of nursing interventions. Nurses most often led interventions aimed at cessation of alcohol use and smoking cessation, reduction of depressive symptoms, attention to information needs, improved adherence to radiotherapy, assessment of trismus, with positive results in quality of life.[12]

Among the data to be analyzed within the nursing process applied to the consultation of this population are the risk factors that correlate with the radiodermatitis outcome. Examples of risk factors are age, Body Mass Index (BMI), concurrent treatments (chemotherapy), comorbidities, nutritional status, smoking habits, and treatment-related variables such as treated tissue volume, technique, type of radiation and energy, treatment field location, dose, fractionation.[5]

Studies on risk factors by tumor topography are considered relevant for not generalizing these factors, taking into account the peculiarities of each histological and topographic type of tumor and its radiobiology. In patients with head and neck cancer, prior knowledge of risk factors can make care more effective, allowing for greater capacity for nursing consultation management and assisting in decision-making. Moreover, this type of study serves as a parameter for analysis of nursing consultation indicators, supporting the evaluation of routines and protocols of prevention and treatment of radiodermatitis.

Thus, the aim of the present study was to evaluate the association between sociodemographic, clinical and treatment factors in the outcome of severe radiodermatitis in patients with head and neck cancer seen at the nursing consultation; and analyze the impact of severe radiodermatitis cases on therapeutic follow-up.

METHOD

This is an exploratory and cross-sectional study conducted through document analysis of medical records at the radiotherapy outpatient clinic of the Cancer Hospital I of the José Alencar Gomes da Silva National Cancer Institute (*Instituto Nacional de Câncer*, INCA). In this institution, the criteria for weekly follow-up in the nursing consultation of radiotherapy cancer patients are total dose treatment from 2,000 centigrays (cGy) and number of ionizing radiation applications greater than ten fractions. Patients out of this criterion are seen at the consultation without regular follow-up.

Radiotherapy patients are picked up by nurses when they start ionizing radiation applications through an invitation in the form of an institutional flyer. When they accept such an invitation, they participate in the “Irradiated Skin Care Guidance Group” and, from this participation, are later scheduled for individual follow-up at the nursing consultation. If the patient is not scheduled for the group until the tenth fraction or does not accept to participate, he is referred directly to the nursing consultation.

The study population consisted of all patients with head and neck cancer who underwent 23 or more radiotherapy fractions, with or without dose booster, who underwent the radiotherapy sector nursing consultation and were discharged from this consultation from January to December 2016. We chose to include patients who had this minimum number of fractions, as it is related to the curative treatment protocol in this tumor topography commonly indicated by the radio-oncologist. In addition, nursing discharge is given when the patient at the end of these treatment fractions presents evaluation of the skin classified with grade zero or grade one.

Therefore, including patients who met the minimum treatment protocol and who were discharged from nursing allows a better assessment of how treatment progressed and, as a consequence, the occurrence of the radiodermatitis outcome, focus of the investigation. Patients who had the re-planned treatment were excluded, since re-planning implies the possibility of changing the dose and number of fractions during the treatment, and patients who had definitive discontinuation of treatment.

Initially, 187 patients were identified in the computerized discharge spreadsheet used by the nurses of the service, which was created to be completed on the day of nursing discharge from the patient's medical records. Such records are made throughout the follow-up at consultations with treatment data and skin assessment according to the RTOG per treatment fraction.

The scoring criterion for acute radiation morbidity of the original RTOG version is graded as follows: Grade zero: no change from start; Grade one: mild erythema, dry epilation and flaking, decreased sweating; Grade two: moderate to bright erythema, uneven wet flaking, moderate edema; Grade three: confluent wet flaking beyond skin folds, severe edema; Grade four: ulceration, hemorrhage and necrosis; Grade five: death.[13] The nurses of the research institution recommend in their care practice to differentiate grade two from grade three the presence of a lesion with at least one and a half centimeters in diameter to identify confluent wet flaking (grade three).

After analyzing the inclusion and exclusion criteria, of the 187 previously identified in the list, 18 did not meet the inclusion criteria, as they were patients with a number of fractions below 23, whose treatment objective was palliative. Of the remaining 169, one had the rescheduled treatment and the other the definitive suspension of treatment and were therefore excluded. Therefore, the final number was 167 patients investigated.

Data collection was performed by the main researcher from 05/01/2017 to 08/12/2017 through access to the patient's medical record. In this sense, after approval of the project by the institutional Ethics Committee, the medical records were requested one day before collection at the hospital's archiving service, which released ten medical records per day.

For the collection, the researcher applied a structured form built for the purpose of the investigation, which included the following sociodemographic variables: age, gender, education, marital status, alcoholism and smoking; clinical variables: comorbidities (hypertension and diabetes), diagnosis, histological type, tumor location, staging, reported maximum grade of radiodermatitis according to the RTOG scale; treatment-related variables: treatment equipment, technique, fraction of early nursing follow-up, concomitant chemotherapy treatment and protocol used, treatment interruption with number of days.

These variables were selected considering the production of knowledge on the theme.[1,3,5] Specifically regarding the data on the treatment technique, it was collected by a resident physicist of the radiotherapy service with access to the computerized planning system, who received information about the research design and the data collection instrument.

The data collected were tabulated, electronically archived and analyzed using the IBM SPSS Statistics (version 23) program. Descriptive data analysis was performed using absolute and relative frequencies, means and standard deviation. For the bivariate analyzes, the chi-square test for categorical variables was chosen and the variance analysis (ANOVA) for continuous variables, both at a descriptive level of 5% for statistical significance. In addition, the binomial logistic regression was elaborated, expressed by the odds ratio (OR) and respective confidence intervals (95% CI).

The study was approved by the institution's Research Ethics Committee in compliance with national ethical standards.

RESULTS

In the studied population there was a predominance of the following sociodemographic characteristics: 68.9% male; 46.7% married; 53.9% of the patients were white and 65.9% had studied until elementary school. The participants' ages ranged from 24 to 87 years old, with a mean of 61.8 years old (±10.5). Regarding alcohol and tobacco consumption, 60.5% of the patients were alcoholics, 74.3% were smokers, of which 41.9% maintained their smoking habits during radiotherapy.

Regarding the clinical data, the most frequent comorbidity was Systemic Arterial Hypertension (SAH), present in 24.0% of the cases, followed by 13.2% of patients with concomitant SAH and Diabetes Mellitus (DM) and 6.0% who only presented DM. There were no reports of comorbidities in 56.8% of the evaluated medical records.

It was found that 99.6% of the patients had some degree of radiodermatitis, with the following distribution: grade one (64.7%), grade two (23.4%), and grade three (11.4%). Only one (0.6%) patient had no radiodermatitis during radiotherapy. Grade four and five were not observed. In the evolution of radiodermatitis to grade three, 63.16% occurred on the last day of the first phase of treatment and/or during the booster dose (second phase of treatment) and 36.84% from the middle of the first phase of treatment until the second to last day of treatment.

According to Table 1, there was no significant association between sociodemographic characteristics and the grade of radiodermatitis. Regarding comorbidities, it was observed that the concomitant presence of DM and SAH was significantly associated with the severity of radiodermatitis (p=0,042), with these patients approximately four times as likely to develop severe radiodermatitis compared to patients without comorbidities.

Table 1 – Association between the sociodemographic and clinical characteristics and the grade of radiodermatitis. Rio de Janeiro, RJ, Brazil, 2017. (n=167)

Variables	Radiodermatitis Grades				OR (CI95%)	*p**
	Grade 0-2		Grade 3			
	n	%	n	%		
Gender						
Female	46	88.5	6	11.5	1.00	
Male	102	88.7	13	11.3	1.00 (0.39 - 2.61)	0.874
Lives with partner						
No	78	88.6	10	11.4	1.0	
Yes	70	88.6	9	11.4	1.00 (0.39 - 2.61)	0.995
Skin color						
White	77	85.6	13	14.4	1.0	
Black	17	94.4	1	5.6	0.35 (0.04-2.85)	0.325
Brown	54	91.5	5	8.5	0.55 (0.19-1.63)	0.279
Schooling						
Secondary/Undergraduate	39	83.0	8	17.0	1.0	
Elementary	101	91.8	9	8.2	0.43 (0.16 - 1.21)	0.822
Illiterate	8	80.0	2	20.0	1.22 (0.22-6.85)	0.110
Age						
Up to 62 years old	80	93.0	6	7.0	1.0	
63 years old or more	68	84.0	13	16.0	2.55 (0.92 - 7.07)	0.065
Smoking						
No	38	88.4	5	11.6	1.0	
Yes	110	88.7	14	11.3	1.03 (0.35 - 3.06)	0.905
Alcoholism						
No	57	86.4	9	13.6	1.0	
Yes	91	90.1	10	9.9	1.44 (0.55 - 3.75)	0.115

Table 1 – Association between

Variables	Radiodermatitis Grades				OR (CI95%)	*p**
	Grade 0-2		Grade 3			
	n	%	n	%		
Comorbidities						
No	88	92.6	7	7.4	1.0	
Hypertension	35	87.5	5	12.5	1.80 (0.53 - 6.04)	0.344
Diabetes	8	80.0	2	20.0	3.14 (0.56 - 17.73)	0.195
Hypertension and Diabetes	17	77.3	5	22.7	3.70 (1.05 - 13.03)	0.042

*chi-square test

The grade of severity of radiodermatitis was associated with the type of equipment (p=0,001), because Cobalt-treated patients were six times more likely to develop severe radiodermatitis than patients treated with the Linear accelerator, according to Table 2. In addition, significant associations were found between the grade of severity and the treatment technique. Patients treated with the 2D technique were six times more likely to develop severe radiodermatitis compared to patients who were planned using Intensity-modulated radiation therapy (IMRT) or Volumetric modulated arc therapy (VMAT). No significant association was observed between the concomitant chemotherapy with radiotherapy variable and the grade of radiodermatitis.

Table 2 – Association between treatment-related variables and grade of radiodermatitis. Rio de Janeiro, RJ, Brazil, 2017. (n=167)

Variables	Radiodermatitis Grades				OR (CI95%)	*p**
	Grade 0-2		Grade 3			
	n	%	n	%		
Equipment						
Lineal accelerator	81	96.4	3	3.6	1.0	
Cobalt	67	80.7	16	19.3	6.45 (1.80-23.07)	0.001
Technique						
VMAT/IMRT	72	96.0	3	4.0	1.0	
3D	60	83.3	12	16.7	4.80 (1.29-17.80)	0.019
2D	16	80.0	4	20.0	6.00 (1.22-29.48)	0.027
Dose						
5200 – 7040 cGy	59	93.7	4	6.3	1.0	
2500 – 5000 cGy	89	85.6	15	14.4	2.48 (0.79-7.86)	0.121
Concomitant chemotherapy with radiotherapy						
No	100	90.1	11	9.9	1.0	
Yes	48	85.7	8	14.3	1.51 (0.57-4.01)	0.400

*chi-square test

Regarding the impact on therapeutic follow-up, of the 19 cases of severe radiodermatitis, 10 (53%) temporarily discontinued treatment. The mean interruption number of days was 11.09 (±8.2). Considering the identified association of the treatment variables in the severe radiodermatitis outcome, their association with treatment discontinuation was also evaluated. The data in Table 3 show that patients treated with Cobalt were approximately five times more likely to discontinue treatment compared to patients treated with Linear accelerator. When patients treated by the IMRT and VMAT techniques were compared with patients treated by the 2D technique, they were approximately six times more likely to discontinue treatment.

Table 3 – Association between the treatment-related variables and treatment discontinuation. Rio de Janeiro, RJ, Brazil, 2017. (n=167).

Variables	Radiodermatitis Treatment Discontinuation				OR (95% CI)	*p**
	YES		NO			
	n	%	n	%		
Equipment						
Lineal accelerator	2	2.4	82	97.6	1.0	
Cobalt	9	10.8	74	89.2	4.98 (1.04-23.83)	0.044
Technique						
VMAT/IMRT	2	2.7	73	97.3	1.0	
3D	6	8.3	66	91.7	3.32 (0.64-17.01)	0.150
2D	3	15.0	17	85.0	6.44 (1.00-41.60)	0.050
Dose						
2500 – 5000 cGy	10	9.6	94	90.4	1.0	
5200 – 7040 cGy	1	1.6	62	98.4	0.37 (0.01-0.95)	0.043

*chi-square test

Regarding the number of nursing consultations, on average, the patients attended 5.3 consultations (±1.9). According to the analysis of variance of the mean of consultations, patients with grade 3 radiodermatitis have a higher number of consultations: 6.1 consultations (±2.1) when compared to the number of consultations of those who have grade 2 Radiodermatitis: 5.2 consultations (±1.7).

DISCUSSION

The sociodemographic characteristics evaluated show a predominance of male participants, aged over 45 years old, who studied until elementary school. These data are similar to a prospective cohort of patients diagnosed with head and neck cancer, in which the majority of head and neck cancer patients were male and in the predominant age group over 40 years old.[14]

Regarding the development of radiodermatitis, 99.6% of the patients had some grade of radiodermatitis. Several studies point out that, in patients with head and neck cancer, the development of radiodermatitis is more common and may affect about 80-90% of this population, due to the more sensitive skin and the presence of folds, which cause constant humidity and friction, resulting in greater skin fragility.[15-16]

Regarding the criteria of acute skin morbidity by the RTOG, it can be stated that grade one is not a limiting factor for the continuity of treatment, since it causes mild symptoms and requires simple conducts when compared to reactions of grades two, three and four, classified as according to the extent of involvement, which result in skin discontinuity. Grades three and four are limiting factors for

the continuity of applications and may interfere with treatment effectiveness, affect quality of life and require more intense team control.[13]

In the research in question there was a predominance of grade one (64.7%), followed by grades two (23.4%) and three (11.4%). It is noteworthy that such a result of grade three reaction is lower than the literature parameters, in which studies in this specific topography show evolution for reaction grade three by up to 44%. However, in these studies it is not mentioned whether there is patient follow-up in the nursing consultation,[6,17] as is the case with the research on screen.

This consideration is made, as evidence indicates that nursing consultations play a fundamental role in minimizing the severity of this event, either through the guidance provided and monitoring adherence to them, or by managing wet flaking when installed, in an attempt to prevent treatment interruption.[11-12]

In the research scenario, the nursing consultation uses the Assistance Protocol for Radiodermatitis, with pharmacological and non-pharmacological measures. The pharmacological measure of first choice is the use of a moisturizer that has *calendula officinalis* in the composition for the prevention of radiodermatitis, and 1% silver sulfadiazine for treatment, when wet flaking is observed. Products such as stingless skin protector, hydrogel, hydrocolloids, and Essential Fatty Acids are second or third choices, used only in cases of allergy or resistance to 1% silver sulfadiazine. As a non-pharmacological measure, patient education on irradiated skin care is provided.

The indexes of radiodermatitis identified can be compared with the results of a study that evaluated the effectiveness of *Calendula officinalis* in relation to Essential Fatty Acids (EFAs) for the prevention and treatment of radiodermatitis in head and neck cancer patients, in which the occurrence of radiodermatitis and its grades were analyzed.[18]

In this clinical trial that included 51 patients who started radiotherapy treatment, it was shown that radiodermatitis developed from the 10th session of radiotherapy, predominantly grade one (EFA-11%, *Calendula*-8%). In the 15th session most did not present radiodermatitis, but 40% of the EFA group had grade one. In the 20th week there was a predominance of grade one radiodermatitis in both groups (EFA-70% and *Calendula*-66%), and grade two was present in 7.41% of the EFA group and in 8.33% of the *Calendula* group. [18]

In the 25th week, the highest incidence of grade 1 radiodermatitis remained in both groups (65.22% and 63.44%), followed by grade two in the EFA group (34.78%) and grade two and three in the *Calendula* group (13.64% each). At the end of the research the authors concluded that *Calendula* was more effective in preventing the development of radiodermatitis.[18]

Regarding the analysis of associations between the variables, there was no significant association between age and severe radiodermatitis, but it should be noted that the data showed a higher frequency of severe radiodermatitis in older patients (over 62 years old), which may be explained by the fact that skin is one of the organs most affected by human aging.

This is because there is exposure to environmental aspects and risk factors throughout life, as well as changes related to structure and function, such as inability to synthesize collagen, decreased tactile sensitivity, inflammatory response and loss of dermis density.[19] Other etiological factors for radiodermatitis, such as smoking and alcoholism, should also be considered for analysis, as they are important for the development of the disease.

Smoking is known to be one of the patient-related factors that may interfere with skin reaction and healing quality. Continued tobacco use reduces the effectiveness of radiotherapy, exacerbates or prolongs complications secondary to treatment of head and neck cancer such as mucositis and xerostomia, and compromises pulmonary function.[3,20]

In a review of radiodermatitis prevention and treatment, one of the included studies showed that smokers and former smokers had higher skin toxicity scores.[15] In the research on screen 74% of the study population were smokers, and 41% maintained the habit during treatment, which explains the fact that of the 19 patients who had grade three radiodermatitis 14 (73.7%) smoked at some point in their lives.

Regarding DM and SAH comorbidities, a statistical significance of these conditions associated with severe radiodermatitis was observed. One of the explanations is that in diabetic patients there is difficulty in wound healing due to blood perfusion deficit, which compromises the adequate supply of oxygen and nutrients and leads to a disorganization of the early stages of repair, causing delayed tissue regeneration.[21]

About SAH, in an article on hypertension in cancer patients, the authors sought to review the association between chemotherapy and radiotherapy and hypertension. These conditions are said to share the same risk factors: physical inactivity, obesity, smoking, poor diet, and alcohol abuse. In particular, in patients with head and neck cancer, as radiotherapy increases survival, it is associated with late complications such as baroreceptor dysfunction. This injury causes increased sympathetic activity, reduced parasympathetic activity, causing increased heart rate and blood pressure lability.[22] Thus, there is damage to tissue perfusion, directly interfering with healing.

Frequently, head and neck cancer patients undergo radiotherapy with chemotherapy, which enhances the development of radiodermatitis.[15] It is noteworthy that in the present study there was no association between chemotherapy-radiotherapy treatment and radiodermatitis, since it shows similarities with a longitudinal study in patients with head and neck cancer that evaluated the association of this variable with oral complications, whose analysis was also not considered statistically significant.[23]

Based on the sociodemographic and clinical variables that have been shown to be associated with the outcome of severe radiodermatitis in patients with head and neck cancer, a counterpoint to the study with a similar objective was established, but focused on breast cancer patients submitted to radiotherapy. In this research, the investigation was conducted with 86 women who underwent radiotherapy for six weeks and were evaluated for the presence of skin reactions from the RTOG. Data were collected on age, coexisting diseases (SAH), smoking habits, and antineoplastic/coexisting treatment.[24]

The incidence of grade one and two was grouped by similarities, reaching 82.6% and grade three of 17.4%, which is considered low for this population. In the investigation, smoking, presence of DM (8.1%), presence of SAH (24.4%) and concomitant chemotherapy did not reach significance in the analysis.[24]

The severity of skin reactions is also attributed to radiation-related factors such as total dose, fractionation scheme, radiation energy (type of equipment), irradiated tissue volume, and radiosensitivity of the tissue involved.[25] External radiotherapy, known as teletherapy, predicts a physical distance between the patient and the radiation source, and is performed on the Linear or Cobalt accelerator equipments. In the Linear accelerator, which is a device that produces high-energy X-ray beams or accelerated electrons and is used to treat various types of tumors, the emitted radiation reaches sensitive cancer cells, allowing healthy cells to recover more easily, reducing the side effect for patients on treatment.[26]

Cobalt-60 uses photon radiation, whose energy is 1.25 MeV (Megaelectron Volt).[4] In the present study, only 3.6% of the patients treated with Linear accelerator had grade three, while 19.3% of the patients treated with Cobalt developed grade three radiodermatitis. This data corroborates the argument that the Linear accelerator decreases the effect of severe radiodermatitis on irradiated skin, justifying the SUS proposal to replace all equipments with Linear accelerators in the coming years.

Regarding the technique used, IMRT generated less grade three reaction when compared to the other techniques, which is in agreement with authors who affirm their advantages over 2D and 3D techniques by reducing exposure of adjacent tissues.[27]

Finally, it is noteworthy that the evolution of radiodermatitis to grade three in the 19 patients in whom this degree was detected occurred in the final phase of treatment. This data suggests that the care provided during the nursing consultation, which involves conducting guidelines and using technologies, may delay the severity of this event. This statement is also supported by the fact that patients who presented grade three had a higher mean number of nursing consultations.

Nursing consultation is considered one of the main activities of nurses in the context of their work in radiotherapy services. This is what the research that sought to know such performance with nurses of radiotherapy services of a public and a private hospital in the state of Pernambuco portrays. The consultation appears as one of the most practiced practices by the radiotherapy nurse, having as one of the most relevant orientations pointed out by the participants the explanations about the side effects in the irradiated region, among which the tissue reactions and the use of products for the prevention of such injuries.[11]

This importance of nursing consultation is confirmed in a review of the main nursing diagnoses in patients with head and neck cancer. The authors argue that, due to the complications of radiotherapy, the nurse's role in the consultation is fundamental when the professional identifies the care demands of this clientele. Therefore, in order to qualify such assistance, its organization and systematization based on nursing diagnosis, interventions and results are necessary. When reviewing the literature, the diagnosis of decreased salivation and inflammation of the oral mucous membrane was present in more than 50% of the articles.[28]

Therefore, the role of nurses is emphasized in the management of care for patients with head and neck cancer, particularly in nursing consultations, assessing their needs with sensitivity and scientific knowledge and in view of quality of life.[29]

One of the limitations of the study was the underreporting in the number of patients treated by the nursing staff in the discharge spreadsheet, due to the possibility of missing patients in the discharge consultation and the loss of data in the computerized system.

CONCLUSION

Severe radiodermatitis is an adverse reaction in head and neck cancer patients undergoing curative indication radiotherapy that should be the focus of attention of professionals, considering the prevalence identified in the study (11.4%) and associated factors, such as: the type of equipments, treatment technique and presence of comorbidities.

Given these data, it is important to adopt interventions that act as a protective factor for the emergence and evolution to more severe grades of radiodermatitis. Thus, it is proposed to strengthen the educational process within the scope of nursing consultation, with the aim of broadening adherence to guidelines by the patient; the testing/evaluation of technologies aimed at preventing and treating radiodermatitis; the implementation of health policies that replace Cobalt equipments with Linear accelerators.

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NOTES

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CONFLICT OF INTERESTS

There is no conflict of interest.

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