Original Article

Predictors and quality of life in patients with radiodermatitis: a longitudinal study

Preditores e qualidade de vida em pacientes com radiodermatite: estudo longitudinal

Predictores y calidad de vida en pacientes con radiodermatitis: estudio longitudinal

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Abstract

Objective: To analyze sociodemographic, clinical and therapeutic predictors and quality of life in patients with radiodermatitis.

Methods: This longitudinal study was conducted with 196 participants who developed skin reactions as an adverse event to radiotherapy treatment. A form was used for clinical characterization and evaluation, and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core30 instrument was used for measuring the quality of life in two stages. Data analysis consisted of the Wilcoxon, Mann-Whitney and Kruskal-Wallis tests, considering a statistically significant difference for $p<0.05$.

Results: The comparison between scores of the quality of life showed that radiodermatitis contributed to the worsening of overall health status and quality of life, deterioration of functional capacity, financial difficulty and intensification of emotional reactions and physical symptoms such as anxiety, depression, pain, fatigue, insomnia and appetite loss. Factors such as sex, income, educational level, concomitant chemotherapy, anatomical location of the injury and degre of tissue destruction were determinant for the greater impairment of global scores. Thus, the need for nursing interventions that favor the identification of predictors and care optimization based on clinical guidelines and recommendations.

Conclusion: Radiodermatitis negatively influenced the quality of life of patients, had a high impact associated with a greater degree of tissue destruction and the main predictors were clinical and therapeutic aspects. Studies of this nature are essential for the formulation of effective, integrated, sustainable and evidence-based public policies aimed at preventing, controlling and treating the injury.

Resumo

Objetivo: Analisar os preditores sociodemográficos, clínicos e terapêuticos e a qualidade de vida em pacientes com radiodermatite.

Métodos: Trata-se de um estudo longitudinal, realizado com 196 pessoas que desenvolveram reações cutâneas como evento adverso ao tratamento radioterápico. Foi utilizado um formulário para caracterização e avaliação clínica e o instrumento *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core30* para mensuração da qualidade de vida em duas etapas. A análise dos dados foi constituída pelos testes *Wilcoxon, Mann-Whitney e Kruskal-Wallis*, considerando diferença estatisticamente significativa para $p < 0,05$.

Resultados: A comparação entre os escores de qualidade de vida mostrou que a radiodermatite contribuiu para piora do estado global de saúde e da qualidade de vida, deterioração da capacidade funcional, dificuldade financeira e intensificação de reações emocionais e de sintomas físicos como ansiedade, depressão, dor,

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fadiga, insônia e falta de apetite. Fatores como sexo, renda, escolaridade, quimioterapia concomitante, localização anatômica da lesão e grau de destruição tecidual foram determinantes para o maior comprometimento dos escores globais. Diante disso, surge a necessidade de intervenções de enfermagem que favoreçam a identificação de preditores e que otimizem o cuidado a partir de diretrizes e recomendações clínicas.

Conclusão: A radiodermatite influenciou negativamente a qualidade de vida dos pacientes, tendo alto impacto associado ao maior grau de destruição tecidual e como principais preditores destacaram-se os aspectos clínicos e terapêuticos. Estudos dessa natureza são imprescindíveis para formulação de políticas públicas efetivas, integradas, sustentáveis e baseadas em evidências voltadas para prevenção, controle e tratamento da lesão.

Resumen

Objetivo: Analizar los predictores sociodemográficos, clínicos y terapéuticos y la calidad de vida en pacientes con radiodermatitis.

Métodos: Se trata de un estudio longitudinal, realizado con 196 personas que presentaron reacciones cutáneas como evento adverso al tratamiento radioterápico. Se utilizó un formulario para la caracterización y evaluación clínica y el instrumento *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core30* para la medición de calidad de vida en dos etapas. El análisis de los datos se realizó a través de las pruebas *Wilcoxon, Mann-Whitney y Kruskal-Wallis*, considerando una diferencia estadísticamente significativa de $p < 0,05$.

Resultados: La comparación entre las puntuaciones de calidad de vida demostró que la radiodermatitis contribuyó con el empeoramiento del estado global de salud y de la calidad de vida, el deterioro de la capacidad funcional, la dificultad financiera y la intensificación de reacciones emocionales y de síntomas físicos como ansiedad, depresión, dolor, fatiga, insomnio y falta de apetito. Factores como sexo, ingresos, escolaridad, quimioterapia simultánea, ubicación anatómica de la lesión y nivel de destrucción tisular fueron determinantes para un mayor comprometimiento de la puntuación global. Ante esto, surge la necesidad de intervenciones de enfermería que favorezcan la identificación de predictores y que optimicen el cuidado a partir de directrices y recomendaciones clínicas.

Conclusión: La radiodermatitis influyó negativamente en la calidad de vida de los pacientes, con un alto impacto relacionado con un mayor nivel de destrucción tisular, y como principales predictores se destacaron los aspectos clínicos y terapéuticos. Estudios de esta naturaleza son imprescindibles para la formulación de políticas públicas efectivas, integradas, sustentables y basadas en evidencias orientadas hacia la prevención, control y tratamiento de la lesión.

Introduction

Despite therapeutic advances and the growing interest in the management of skin injuries, radiodermatitis is the main adverse event of radiotherapy; it constitutes a serious problem of high incidence, compromises the Quality of Life (QoL) of patients, generates high costs to health services and requires substantial efforts for prevention, control and treatment.[1,2]

Radiodermatitis is a concept comprising a set of skin injuries resulting from intense exposure to ionizing radiation that affects 85% of patients and can be intensified by physical, clinical and therapeutic conditions, since the extension of the irradiated area, concomitant therapies and daily living habits can contribute to a higher degree of tissue destruction.[3,4]

Although the changes start after the first radiation, continuous exposure to fractional doses causes continuous cellular damage, which prevents tissue repair and intensifies after the second week of treatment with the manifestation of mild erythema, dry or wet desquamation, fluid leakage, necrosis, deep ulcerations and local infection.[5,6]

Clinical guidelines and care protocols that describe nursing care or appropriate topical products for handling the reaction are incipient. However, prevention is recommended and can be guided by the nurse's clinical experience, degree of tissue destruction, availability of material resources, use of topical products and skin care guidelines.[7]

The literature demonstrates that the magnitude of the reaction can be measured by disabilities and impairments in QoL.[2,7] Thus, the impact associated with the injury may reflect dissatisfaction with the therapeutic efficacy, lead to physical limitations, the development of emotional reactions, intensification of symptoms and prolongation or interruption of treatment progression.[8,9]

Under the oncological aspect, the measurement of QoL is widely referenced and aims to direct public policies and guide the care practice, the definition of conducts, the planning of the rehabilitation process and the evaluation of care, considering the subjectivity of people through tools and measuring instruments.[9,10]

Different concepts are applied to the term "Quality of Life" and they involve social, economic and health parameters. In this study, the definition proposed by the World Health Organization, which considers the "perception of the individual about his position in life, according to the cultural context and value system with which he lives and in relation to his goals, expectations, standards and concerns"[11], was adopted because this concept includes the entire therapeutic path that a cancer patient may undergo.

Considering the possibility of minimizing the impacts related to radiodermatitis from the measurement

of QoL and approaches directed to its characteristics, the objective of this study was to analyze the sociodemographic, clinical and therapeutic predictors and the quality of life in patients with radiodermatitis.

Methods

This is a longitudinal observational study. It was conducted in the radiotherapy division of a referral hospital for cancer treatment in Teresina, Piauí, Brazil, from January to July 2018.

The sample design was performed using the technique for infinite populations, considering the assumed prevalence of radiodermatitis of 85%, margin of error of 5% and confidence level of 95%. Thus, the study consisted of 196 people undergoing radiotherapy, aged 18 years or over and a minimum prescription of 12 sessions. Patients with neurological, clinical or cognitive complications, unable to understand the forms and those who did not present skin reactions during treatment were excluded from the study.

After a review of the literature[2] and selection of the best evidence, two forms were prepared for sociodemographic, clinical and therapeutic characterization and assessment of the presence and intensity of skin toxicity. These forms were submitted to the appreciation of specialists for assessment of their relevance, objectivity and clarity of items, content validation and adequacy to the proposed objectives. From this perspective, the variables investigated were sex, age, marital status, education, religion, origin, previous comorbidities, cancer location, time of diagnosis and treatment, number of prescribed radiotherapy sessions, degree of tissue destruction and concomitant therapies.

For the classification of grades of toxicity, the recommendations proposed by the Radiation Therapy Oncology Group (RTOG) were followed. It classifies the reaction into five grades of tissue destruction: grade 0 - no reaction, intact skin; grade 1 - mild erythema, epilation and / or dry peeling; grade 2 - painful erythema, localized moist desquamation and/or moderate swelling; grade 3 - confluent moist desquamation and/or severe swelling; and grade 4 - ulceration, hemorrhage and / or necrosis. [12]

Quality of life was measured using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core30 (EORTC QLQ-C30). This tool was developed by the European Organization Research Treatment of Cancer (EORTC), translated and validated for the Portuguese language, and consists of 30 items distributed in four scales and fifteen domains that assess the overall health status and quality of life, functional capacity, the presence and intensity of symptoms and financial difficulties.[13]

All scores were standardized in a linear transformation ranging from 0 to 100, according to recommendations proposed by the EORTC Scoring Manual,[14] in which, for the overall health status and functioning scales, the higher the score, the better the QoL. Regarding the symptom scale, high scores reflect a higher intensity of symptoms and worse QoL. Note that authorization was requested for the use of this instrument and obtained through registration of the research project.

Data were collected in two stages, after contacting the nurse responsible for the radiotherapy sector for the survey of patients who met the inclusion criteria, certification of diagnosis and treatment, and sample selection. The low educational level common in the studied population explains the choice of the interview, in which items were read by the researcher, and the evaluation lasted an average of 30 minutes.

The first stage comprised the initial period of radiotherapy treatment, predominantly up to the tenth session, with sociodemographic, clinical and therapeutic variables collected through analysis of medical records and application of the EORTC QLQ-C30 instrument for assessment of the QoL before manifestation of the adverse event. The second phase also occurred during radiotherapy, after the twelfth application, specifically at the time corresponding to the worst stage of the injury, with evaluation of the intensity and characteristics of the reaction, and application of the EORTC QLQ-C30 for assessment of the QoL.

The insertion of participants in the study happened at random and during the study 234 people were potentially eligible. Of these, 38 were excluded, 15 in the first stage due to clinical, neurological and cognitive disabilities and 23 in the second

stage due to no skin reactions during the evaluation period. Thus, 196 people undergoing radiotherapy treatment participated in the two stages of the study.

Data were inserted in a spreadsheet with double entry in the Microsoft Office Excel software and exported to the Statistical Package for the Social Sciences (SPSS). Sociodemographic, clinical and therapeutic variables were expressed as mean, standard deviation, maximum and minimum, absolute and relative frequency.

The Kolmogorov-Smirnov adherence test was performed to check the distribution of data, the Wilcoxon for comparison between the average QoL scores before and after the development of the injury, and the Mann-Whitney and Kruskal-Wallis to check associations between QoL and qualitative dichotomous and polytomous variables, respectively. All analyzes were conducted at a 5% significance level and results with p-value below 0.05 were considered significant ($p<0.05$).

The study was approved by the Research Ethics Committee of the Universidade Federal do Piauí under protocol number 2.379.708. Participation was voluntary and conditioned to the signature of the Informed Consent form.

Results

The descriptive study of the sample showed a predominance of females 126 (64.3%), with an average age of 55.4 ± 13.5 years, married or in a stable relationship 125 (63.8%), retired 78 (39, 8%), Catholics 152 (77.6%), with elementary education 101 (51.5%), low income 116 (59.2%) and from other municipalities in the state of Piauí 89 (45.4%). Regarding clinical conditions, all participants presented comorbidities and associated factors for the development of cancer, with prevalence of a family history of the disease 112 (57.1%), followed by smoking 83 (42.4%), systemic arterial hypertension 61 (31.1%), alcoholism 46 (23.5%) and diabetes mellitus 28 (14.3%).

The time of diagnosis varied from three to six months for most people 132 (67.4%) and the anatomical locations most affected by the neoplasm were the breast 52 (26.5%), head and neck 40 (20.4 %), prostate 39 (19.9%) and cervix 38 (19.4%). Regarding therapeutic methods, prescriptions between 12 to 30 radiotherapy sessions prevailed 153 (78.1%), and the concomitant administration of chemotherapy was adopted for 70 (35.7%) participants.

The evaluation of the clinical characteristics of radiodermatitis showed the prevalence of grade 2 reactions in 115 (58.7%) patients, with epithelial tissue 118 (60.2%), without exudate 144 (73.5%) and with a higher incidence in the inguinal region 73 (37.2%), breast 54 (27.6%), and head and neck 39 (19.9%). The therapeutic methods adopted for the control and treatment of the injury were based on the topical application of a dressing with chamomile 189 (96.4%), aloe vera cream 182 (92.9%), Essential Fatty Acid (AGE) 19 (9.7%), hydrogel 5 (2.6%) and sulfadiazine with silver 2 (1.0%).

The results expressed in table 1 demonstrate the comparison between average QoL scores measured in the two stages of the study. In the overall health and QoL scale, after the reaction appeared, there was a reduction in the scores with significant differences ($p <0.05$), as well as in the functioning scale with more impairment in the physical, role functioning, emotional and social domains. In the symptoms, there was an increase in the scores of fatigue, nausea and vomiting, pain, insomnia and appetite loss domains, indicating the intensification of symptoms.

Table 1. Average quality of life scores before and after radiodermatitis

Scales and domains	First evaluation A ± SD	Second evaluation A ± SD	*p-value*
Overall health and QoL	76.5 ± 15.7	35.5 ± 18.5	<0.001*
Functioning			
Physical	84.8 ± 20.4	65.8 ± 25.3	<0.001*
Role functioning	77.9 ± 24.7	48.9 ± 31.0	<0.001*
Emotional	77.8 ± 21.4	41.8 ± 29.56	<0.001*
Cognitive	89.2 ± 16.0	82.6 ± 23.5	<0.001*
Social	85.9 ± 18.2	58.4 ± 28.3	<0.001*
Symptoms			
Fatigue	19.1 ± 16.7	50.9 ± 22.9	<0.001*
Nausea and vomiting	10.5 ± 18.0	18.0 ± 27.8	<0.001*
Pain	5.1 ± 11.3	40.1 ± 25.1	<0.001*
Dyspnea	3.4 ± 11.6	4.5 ± 12.8	0.108
Insomnia	21.9 ± 27.7	54.1 ± 35.3	<0.001*
Appetite loss	16.2 ± 24.3	40.8 ± 38.6	<0.001*
Constipation	11.0 ± 22.9	9.6 ± 18.7	0.401
Diarrhea	8.8 ± 21.3	7.2 ± 14.5	0.257
Financial difficulty	51.8 ± 37.6	80.6 ± 30.5	<0.001*

A (±SD) - average and standard deviation; *Significant difference for $p < 0.05$

Table 2 shows the comparison between sociodemographic and therapeutic characteristics with the EORTC QLQ C-30 scales and domains. Among the associations, the scores of overall health and QoL scales, functioning, symptoms and financial difficulty were determined by different aspects, such as education, income, treatment time and concomitant chemotherapy (p <0.05).

The anatomical location of the injury, specifically in the breast and inguinal region, as well as the grade of reaction and the type of tissue represented important clinical predictors associated with the worst overall health and quality of life (Table 3).

Discussion

The results of this study corroborate the epidemiological profile of the injury at national and international level, which show the greater involvement of the inguinal region, breast, and head and neck. The high incidence of radiodermatitis in these regions

Table 2. Analysis of sociodemographic and therapeutic predictors of quality of life in patients with radiodermatitis

Scales and domains / Variables	Sex p-value	Marital Status p-value	Educational level p-value	Income p-value	Cancer location p-value	Nr. of sessions p-value	Chemotherapy p-value
Overall health and QoL	0.095	0.793	0.489	0.522	0.106	0.652	0.002*
Functioning							
Physical	0.878	0.706	0.964	0.412	0.015*	0.036*	0.026*
Role functioning	0.008*	0.046*	0.732	0.152	0.074	0.440	0.003*
Emotional	0.010*	0.951	0.061	0.421	0.07	0.307	0.133
Cognitive	0.906	0.157	0.018*	0.151	0.549	0.129	0.678
Social	0.584	0.023*	0.620	0.331	0.437	0.291	0.118
Symptoms							
Fatigue	0.018*	0.607	0.526	0.008*	0.026*	0.356	0.001*
Nausea and vomiting	0.191	0.506	0.420	0.586	0.01*	0.763	0.001*
Pain	0.609	0.664	0.299	0.401	0.488	0.494	0.001*
Dyspnea	0.127	0.212	0.995	0.967	0.195	0.005*	0.016*
Insomnia	0.018*	0.563	0.648	0.517	0.210	0.182	0.138
Apetite loss	0.146	0.172	0.854	0.392	0.025*	0.198	0.001*
Constipation	0.677	0.001*	0.568	0.701	0.014*	0.128	0.285
Diarrhea	0.083	0.119	0.873	0.774	0.001*	0.18	0.19
Financial difficulty	0.133	0.716	0.033*	0.001*	0.669	0.229	0.645

* Significant difference for p <0.05

Table 3. Clinical predictors of quality of life in patients with radiodermatitis

Scales and domains/ location and clinical characteristics	Head and neck p-value	Breast p-value	Vaginal p-value	Inguinal p-value	Grade p-value	Type of tissue p-value	Quantity of exsudate p-value
Overall health and QoL	0.035*	0.180	0.134	0.045*	<0.001*	<0.001*	<0.001*
Functioning							
Physical	0.957	0.017*	0.831	0.018*	<0.001*	<0.001*	0.007*
Role functioning	0.144	0.188	0.886	0.003*	<0.001*	<0.001*	0.002*
Emotional	0.366	0.199	0.805	0.807	0.759	0.892	0.508
Cognitive	0.111	0.825	0.903	0.340	0.002*	0.046*	<0.001*
Social	0.020*	0.504	0.942	0.003*	<0.001*	<0.001*	<0.001*
Symptoms							
Fatigue	0.065	0.191	0.063	0.726	0.020*	0.020*	0.259
Nausea and vomiting	0.03*	0.947	0.105	0.671	<0.001*	<0.001*	<0.001*
Pain	0.538	0.412	0.793	0.173	0.381	0.550	0.391
Dyspnea	0.392	0.225	0.817	0.141	0.022*	0.013*	0.016*
Insomnia	0.108	0.602	0.039*	0.032*	0.001*	<0.001*	0.070
Apetite loss	0.518	0.251	0.361	0.996	0.039*	0.183	0.350
Constipation	0.066	0.584	0.454	0.938	0.553	0.871	0.116
Diarrhea	0.036*	0.754	0.006*	0.116	<0.001*	<0.001*	<0.001*
Financial difficulty	0.997	0.083	0.799	0.182	0.001*	<0.001*	0.002*

* Significant difference for p <0.05

is related to the treatment zone, since in large areas with direct incidence of radiation, little adipose tissue or the presence of folds, moisture and friction become common and result in skin fragility.[15]

All manifestations of the injury occurred after the second week of treatment and remained in grade 2, as in another study that indicated the presence of the injury after the 12th radiotherapy session. The severity of reactions can be attributed to the therapeutic plan, in which the technique and the high number of sessions is decisive for the greatest degree of tissue destruction, since continuous radiation prevents the phases of proliferation, maturation and repair common in the healing process.[5,16]

Although clinical recommendations and evidence of validity, safety and proven efficacy are incipient, the application of chamomile compresses and aloe vera creams was frequent, given its already evidenced radioprotective activities, anti-inflammatory and analgesic effects, as well as its potential to control physical symptoms and delay the occurrence of the injury.[17,18]

In this sense, the care provided by the nurse becomes essential and stands out for involving the following factors in the management of the injury: activities aimed at adequate assessment of the grade of toxicity; the control of behaviors and life habits that hinder tissue repair; the recognition of predictors that interfere with the direction and adherence to treatment and patient survival; and the fulfillment of needs of information, self-care promotion and maintenance of quality of life.[16-19]

The initial measurement of QoL showed lower impairment in global scores, better health status/QoL, as well as less intense physical symptoms and financial difficulties. These commitments may reflect the absence of adverse events to the therapeutic modality, the process of acceptance and self-confidence, the mechanisms for coping with the disease and the ability to adapt to the new condition of life, once the healing process is initiated.[20]

Despite considering that other clinical conditions can impact patients' lives, the literature shows that QoL decreases during radiotherapy due to the high incidence of adverse events such as dermatitis, leading to disability, complications and psychopathological comorbidities.[2] This study suggests the assessment of QoL so that supportive care is focused on the identified losses.

The evaluations performed after the identification of the worst stage of radiodermatitis showed negative impacts and indicated greater impairment of functioning scales, specifically in the physical, emotional, cognitive and social domains, as well as the intensification of clinical symptoms.

Among the scales and domains, the financial difficulty was the most affected, and the average score increased to 80.61 ± 30.47, which corroborates with the characteristics of participants, since most were retired or unemployed and moved from the hinterlands or other states given the centralization of referral institutions, resulting in family breakdown and distancing and higher costs. In addition, the degree of tissue destruction contributed to a greater compromise of this score, in view of the need to acquire therapeutic resources and topical products for its management.[21]

The financial difficulty may also reflect the Brazilian reality in the social, labor and economic segment, in which disabilities resulting from illness and treatment are related to loss of productivity, difficulties in accessing information and deficiencies in the recognition of risk factors, leading to late diagnoses, a higher degree of dependence and increased mortality indicators.[22]

In the literature, the worsening of the overall health status and QoL related to radiodermatitis is also reported, in which the long treatment time, extension of the irradiated area and the degree of tissue destruction are predictors of limited functional capacity, intensification of physical symptoms and emotional reactions.[1,7]

Consistent with international evidence, chemotherapy concomitant with radiotherapy treatment had repercussions on average scores and represented a risk factor for the development of the reaction, resulting in a greater extent of the injury and involvement of secondary structures such as the axillary region, common in cases of breast cancer.[23,24] In clinical trials, was found a higher incidence of the reaction in patients undergoing chemotherapy as an adjunct to the therapeutic plan.[25,26]

For the functioning scale, the greatest commitment was concentrated in the emotional domain, revealing a significant impact on psychological well-being. Characterized by stress and decreased physical capacity, clinical and therapeutic variables such as the number of radiotherapy sessions, concomitant chemotherapy and the grade of injury were associated and resulted in changes in life priorities, constant concerns, symptoms of anxiety and depression, uncertainties and low self-esteem.[27]

The role functioning and physical functioning domains were also affected and contributed to worse QoL. The age variable was associated, showing that the increase in life expectancy favors the incidence of chronic noncommunicable diseases that represent a significant demand for health services and are configured as causes of hospitalization among older adults.[28,29]

Social functioning scale scores were related to marital status, degree of injury and head and neck involvement. When the injury develops in specific anatomical locations, it can lead to changes in body image that increase the risks for social isolation and emotional repercussions, reflecting the need to strengthen support networks and the active participation of family members in the care plan.[30]

In the symptom scale, the comparison of scores showed greater intensity of fatigue, nausea and vomiting, pain, insomnia and poor appetite. These are recognized as common symptoms in cancer patients, and were attributed to the incidence of adverse reactions such as the high degree of tissue destruction that affects the overall health status.[7,18]

Thus, high-intensity pain, the most reported symptom, had the greatest impact on quality of life and was also found in other studies.[31,32] Elevated pain levels are a frequent and highly expressed condition in patients with radiodermatitis, become stronger according to the greater degree of tissue destruction, limit activities of daily living and functional capacity, and generate psychological discomfort and states of dependence.[18]

Despite the high prevalence of pain, one of the challenges is the underdiagnosis related to ineffective strategies for evaluation, difficulty or reluctance to express symptoms, which is a concern related to dependence on analgesic drugs or fear of reactions and drug interactions.[33]

Fatigue and changes in sleep patterns were also common and characterized by the subjective feeling of tiredness resulting from pre-existing wear and tear; these manifestations reduce functionality and independence and are intensified when combined with emotional reactions and high levels of pain.[34,35]

Given the magnitude of the reaction and impacts on QoL, there is a need for effective nursing interventions, such as the identification of predictors and implementation of strategies aimed at preventing, controlling and treating the injury. Nevertheless, knowing the QoL of these patients allows the planning of care based on guidelines and clinical recommendations aimed at safe care.

The limitations of this study refer to the design that does not allow establishing a cause and effect relationship, and the failures in medical records of the patients that made it difficult to identify the radiation-related variables.

Conclusion

Radiodermatitis generated negative impacts on the overall health status and QoL of patients, with greater impairments in functional capacity, role functioning, physical, social and emotional functioning. In addition, it generated financial difficulties and intensified symptoms such as fatigue, nausea and vomiting, pain and insomnia. Sociodemographic, clinical and therapeutic variables such as sex, educational level, income, length of treatment, number of radiotherapy sessions, concurrent chemotherapy, location of the reaction and degree of tissue destruction were predictors of worse QoL.

Collaborations

Rocha DM, Pedrosa AO and Oliveira AC contributed to the design of the project, analysis and interpretation of data and writing of the article. Santos AMR, Benício CDAV, Nogueira LT contributed to

a critical review of the intellectual content and final approval of the version to be published.

References

1. Beamer LC, Grant M. Longitudinal trends in skin-related and global quality of life among women with breast radiodermatitis: A pilot study. Eur J Oncol Nurs. 2018;33:22–7.
2. Rocha DM, Pedrosa AO, Oliveira AC, Bezerra SM, Benício CD, Nogueira LT. Scientific evidence on factors associated with the quality of life of radiodermatitis patients. Rev Gaúcha Enferm. 2018;39(e2017-0224):1-8.
3. Bray FN, Simmons BJ, Wolfson AH, Nouri K. Acute and chronic cutaneous reactions to ionizing radiation therapy. Dermatol Ther (Heidelb). 2016;6(2):185–206.
4. Ryan JL. Ionizing radiation: the good, the bad, and the ugly. J Invest Dermatol. 2012;132(3 Pt 2):985–93.
5. Schneider F, Danski MT, Vayego SA. Usage of Calendula officinalis in the prevention and treatment of radiodermatitis: a randomized double-blind controlled clinical trial. Rev Esc Enferm USP. 2015;49(2):221–8.
6. Huang A, Glick SA. Genetic susceptibility to cutaneous radiation injury. Arch Dermatol Res. 2017;309(1):1–10.
7. Fuzissaki MA, Paiva CE, Oliveira MA, Lajolo Canto PP, Paiva Maia YC. The impact of radiodermatitis on breast cancer patients' quality of life during radiotherapy: a prospective cohort study. J Pain Symptom Manage. 2019;58(1):92–99.e1.
8. Spałek M. Chronic radiation-induced dermatitis: challenges and solutions. Clin Cosmet Investig Dermatol. 2016;9(9):473–82.
9. Villar RR, Fernández SP, Garea CC, Pillado MT, Barreiro VB, Martín CG. Quality of life and anxiety in women with breast cancer before and after treatment. Rev Lat Am Enfermagem. 2017;25:e2958.
10. Sawada NO, Nicolussi AC, de Paula JM, Garcia-Caro MP, Marti-Garcia C, Cruz-Quintana F. Quality of life of Brazilian and Spanish cancer patients undergoing chemotherapy: an integrative literature review. Rev Lat Am Enfermagem. 2016;24:e2688.
11. WHO. The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. Soc Sci Med. 1995;41(10):1403–9.
12. Radiation Therapy Oncology Group (RTOG). Acute Radiation Morbidity Scoring Criteria. RTOG:c2020. [cited 2020 Jul 16]. Available from: https://www.rtog.org/researchassociates/adverseeventreporting/rtogeortclateradiationmorbidityscoringschema.aspx
13. Fayers P, Bottomley A; EORTC Quality of Life Group; Quality of Life Unit; European Organisation for Research and Treatment of Cancer. Quality of life research within the EORTC-the EORTC QLQ-C30. Eur J Cancer. 2002;38(4 Suppl 4):S125–33.
14. Fayers PM, Aaronson NK, Bjordal K, Groenvold M, Curran D, Bottomley A, et al. The EORTC QLQ-C30 scoring manual. 3rd ed. Brussels; 2001.
15. Cui Z, Xin M, Yin H, Zhang J, Han F. Topical use of olive oil preparation to prevent radiodermatitis: results of a prospective study in nasopharyngeal carcinoma patients. Int J Clin Exp Med. 2015;8(7):11000–6.
16. Cardozo AS, Simões FV, Santos VO, Portela LF, Silva RC. Severe radiodermatitis and risk factors associated in head and neck cancer patients. Texto Contexto Enferm. 2020;9:e20180343.
17. Ferreira EB, Ciol MA, Vasques CI, Bontempo PS, Vieira NN, Silva LF, et al. Gel of chamomile vs. urea cream to prevent acute radiation dermatitis in patients with head and neck cancer: a randomized controlled trial. J Adv Nurs. 2016;72(8):1926–34.
18. Rao S, Hegde SK, Baliga-Rao MP, Palatty PL, George T, Baliga MS. An aloe vera-based cosmeceutical cream delays and mitigates ionizing radiation-induced dermatitis in head and neck cancer patients undergoing curative radiotherapy: a clinical study. Medicines (Basel). 2017;4(3):44.
19. Stylianou C, Kafasi A, Papageorgou DK. Nurse led interventions for patients with head and neck cancer. Nosileftiki. 2017;56(2):97–106.
20. Freire ME, Costa SF, Lima RA, Sawada NO. Health-related quality of life of patients with cancer in palliative care. Texto Contexto Enferm. 2018;27(2):e5420016.
21. Dean LT, Moss SL, Ransome Y, Frasso-Jaramillo L, Zhang Y, Visvanathan K, et al. "It still affects our economic situation": long-term economic burden of breast cancer and lymphedema. Support Care Cancer. 2019;27(5):1697–708.
22. Sadovsky AD, Poton WL, Reis-Santos B, Barcelos MR, Silva IC. Índice de Desenvolvimento Humano e prevenção secundária de câncer de mama e colo do útero: um estudo ecológico. Cad Saude Publica. 2015;31(7):1539–50.
23. O'Donovan A, Coleman M, Harris R, Herst P. Prophylaxis and management of acute radiation-induced skin toxicity: a survey of practice across Europe and the USA. Eur J Cancer Care (Engl). 2015;24(3):425–35.
24. Manas A, Santolaya M, Ciapa VM, Belinchón B, Tully F. Topical R1 and R2 prophylactic treatment of acute radiation dermatitis in squamous cell carcinoma of the head and neck and breast cancer patients treated with chemoradiotherapy. Eplasty. 2015;15:e25.
25. Elliott EA, Wright JR, Swann RS, Nguyen-Tân F, Takita C, Bucci MK, et al.; Radiation Therapy Oncology Group Trial 99-13. Phase III Trial of an emulsion containing trolamine for the prevention of radiation dermatitis in patients with advanced squamous cell carcinoma of the head and neck: results of Radiation Therapy Oncology Group Trial 99-13. J Clin Oncol. 2006;24(13):2092–7.
26. Wells M, Macmillan M, Raab G, MacBride S, Bell N, MacKinnon K, et al. Does aqueous or sucralfate cream affect the severity of erythematous radiation skin reactions? A randomised controlled trial. Radiother Oncol. 2004;73(2):153–62.
27. Hindley A, Zain Z, Wood L, Whitehead A, Sanneh A, Barber D, et al. Mometasone furoate cream reduces acute radiation dermatitis in patients receiving breast radiation therapy: results of a randomized trial. Int J Radiat Oncol Biol Phys. 2014;90(4):748–55.
28. Silva AM, Mambrini JV, Souza JP, Andrade FB, Costa MF. Hospitalizations among older adults: results from ELSI-Brazil. Rev Saude Publica. 2018;52(2):1–10.
29. Minosso JS, Souza LJ, Oliveira MA. Rehabilitation in palliative care. Texto Contexto Enferm. 2016;25(3):e1470015.
30. Jagannathan A, Juvva S. Emotions and coping of patients with head and neck cancers after diagnosis: A qualitative content analysis. J Postgrad Med. 2016;62(3):143–9.
31. Bazire L, Fromantin I, Diallo A, de la Lande B, Pernin V, Dendale R, et al. Hydrosorb® versus control (water based spray) in the management of radio-induced skin toxicity: results of multicentre controlled randomized trial. Radiother Oncol. 2015;117(2):229–33.
32. Chan RJ, Mann J, Tripcony L, Keller J, Cheuk R, Blades R, et al. Natural oil-based emulsion containing allantoin versus aqueous cream for managing radiation-induced skin reactions in patients with cancer: a phase 3, double-blind, randomized, controlled trial. Int J Radiat Oncol Biol Phys. 2014;90(4):756–64.

33. Andrade FS, Clark RM, Ferreira ML. Effects of low-level laser therapy on wound healing. Rev Col Bras Cir. 2014;41(2):129–33.

34. Borges JA, Quintão MM, Chermont SM, Filho HT, Mesquita ET. Fadiga: Um Sintoma Complexo e seu Impacto no Câncer e na Insuficiência Cardíaca. Int J Cardiovasc Sci. 2018;31(4):433–42.

35. Younus J, Lock M, Vujovic O, Yu E, Malec J, D'Souza D, et al. A case-control, mono-center, open-label, pilot study to evaluate the feasibility of therapeutic touch in preventing radiation dermatitis in women with breast cancer receiving adjuvant radiation therapy. Complement Ther Med. 2015;23(4):612–6.