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RESEARCH ARTICLE

IMPACT OF CONCURRENT CHEMORADIOTHERAPY ON QUALITY OF LIFE AND MOOD IN PATIENTS WITH LARYNGEAL CANCER

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Abstract

Introduction: Laryngeal cancer, often treated with radiotherapy and chemotherapy, Although chemoradiotherapy is effective for treating laryngeal cancer, it can significantly affect patients' quality of life (QoL). This study aimed to describe the impact of chemoradiotherapy on the quality of life and mood of patients with laryngeal cancer.
Methods: A retrospective study involving 127 patients with Tis-T3 laryngeal cancer assessed QoL and depressive symptoms before treatment, and at 6 and 12 months post-treatment using validated questionnaires (EORTC QLQ-C30, H &N35, CES-D).
Results: Physical functioning and head and neck-specific symptoms worsened at 6 months, but most improved by 12 months, except for taste/smell, dry mouth, and sticky saliva. Emotional functioning and mood improved over time despite physical deterioration.
Conclusion: Concurrent chemoradiotherapy leads to temporary QoL deterioration, followed by gradual recovery and improved emotional wellbeing, highlighting the importance of long-term psychological support.

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Introduction:-

Quality of life (QOL) is an important issue in oncology. It is a multidimensional concept that includes four main areas: physical functioning, psychological functioning, social interaction, and symptoms related to the disease and treatments. Quality of life is an important indicator of treatment outcomes and is used as an endpoint in clinical trials.[1]Patients with head and neck cancers, such as laryngeal cancer, must not only cope with a potentially fatal disease but also with the impact of this disease and its treatment on their physical, psychological, and social functioning. [2]The impact of laryngectomy on quality of life (QOL) has received significant attention [3,4] , particularly focusing on speech rehabilitation [5] .

It is likely that early-stage laryngeal cancer, treated with radiotherapy or concurrent chemoradiotherapy, has much less of an impact on quality of life. However, a cross-sectional study found a surprising number of issues following radiotherapy for stage T1 laryngeal cancer[6] . In two comparative studies involving a limited number of patients, radiotherapy caused less physical dysfunction (especially regarding speech) than laryngectomy [7,8] . Despite this, no differences were observed in terms of overall quality of life, psychological distress, and life satisfaction between

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patients who underwent laryngectomy and those who received radiotherapy.Quality of life has rarely been systematically assessed in patients with laryngeal cancer. Most studies are retrospective and hindered by insufficient methodology [9,10] . Systematic prospective studies in this area, including a large number of patients and using standardized and validated instruments, are needed [11] . The factors determining quality of life are mostly unknown and need to be clarified. This could help healthcare professionals make treatment decisions, identify patients at risk for psychosocial problems, and plan rehabilitation. We conducted a retrospective study on the quality of life and mood of patients with laryngeal cancer treated with concurrent chemoradiotherapy.The objective of the study was to describe the quality of life (and its domains) as well as the mood of patients with laryngeal cancer treated with concurrent chemoradiotherapy before and after treatment.

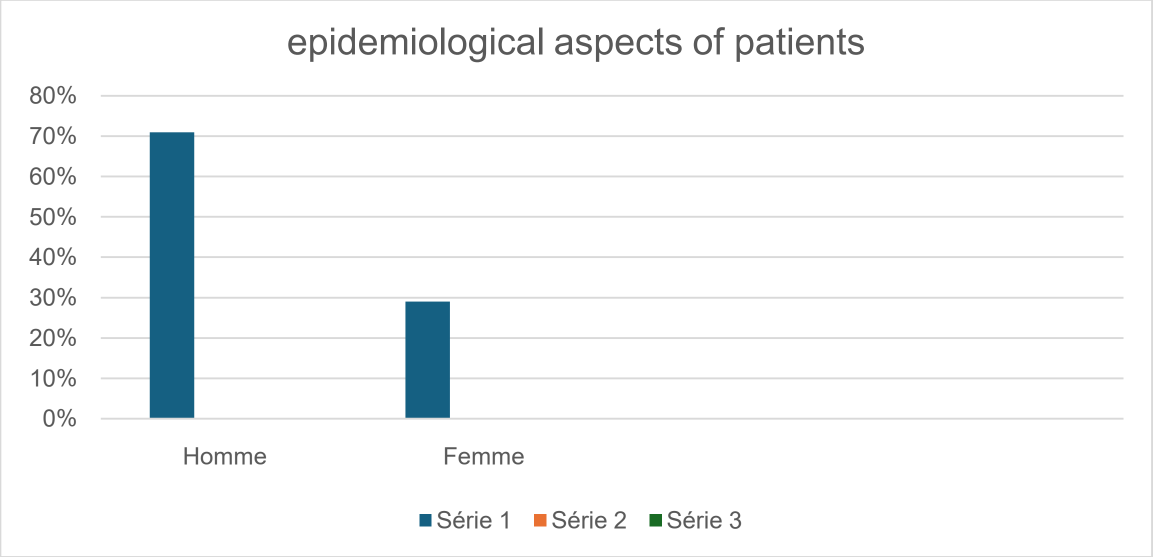
Materials and Methods:-

A retrospective analysis was conducted on 127 patients with histologically confirmed Tis or T1-T3 laryngeal cancer, followed at the National Oncology Institute of Rabat and treated with conformational intensity-modulated radiotherapy (IMRT) as a curative treatment, along with concurrent chemotherapy, between January 2022 and January 2024. Patients were excluded if they had metastatic disease.The questionnaire consisted of the European Organization for Research and Treatment of Cancer (EORTC) Core Quality of Life Questionnaire (QLQ-C30[+3]), the EORTC Head and Neck Cancer Quality of Life Questionnaire (H&N35), and the Center for Epidemiological Studies Depression Scale (CES-D).The EORTC QLQ-C30 is a central, widely used questionnaire that includes a range of quality of life (QOL) questions relevant to patients with laryngeal cancer [12] . It contains five functional scales (physical, role, emotional, cognitive, and social), three symptom scales (fatigue, pain, and nausea/vomiting), a global QOL scale, and six individual items assessing additional symptoms or problems (dyspnea, insomnia, loss of appetite, constipation, diarrhea, and financial difficulties). The version 30(+3) includes two additional items on role functioning and one additional item on overall health.

The Head and Neck Cancer Quality of Life Questionnaire (H&N35) is a module used to assess the QOL of patients with head and neck cancer [13]. This module includes seven symptom scales (pain, swallowing, taste/smell, speech, social eating, social contact, and sexuality) and six symptom items (dental problems, trismus, dry mouth, sticky saliva, cough, and discomfort). It was validated in a sample of 500 head and neck cancer patients from Norway, Sweden, and the Netherlands.[14]All scales and items from the EORTC QLQ-C30(+3) and the EORTC H&N35 have scores ranging from 0 to 100. A high score on a functional scale or global QOL scale indicates a high level of functioning or global quality of life, whereas a high score on a symptom scale or item indicates a high level of symptoms or problems. [15]The CES-D scale is an instrument used to measure depression in the general (non-psychiatric) population [16]. The CES-D provides a total score ranging from 0 to 60. A high score reflects a high level of depression. A threshold of 16 can be used, with patients scoring 16 or higher classified as exhibiting depressive symptoms. [17]

Results:-

During this period, we collected 127 cases of laryngeal cancer. The age of the patients ranged from 29 to 81 years, with an average age of 56 years and a male predominance of 71%.



Analysis was used to compare the means of all the scales and individual items of the QLQ-C30(+3) and H&N35, as well as the total CES-D score at baseline, 6 months, and 12 months.Changes may occur in a linear manner (progressive increase or decrease at 6 and 12 months compared to baseline), curvilinear manner (increase or decrease at 6 months, followed by a decrease or increase, respectively, returning to baseline at 12 months), or as a combination of both patterns (increase or decrease at 6 months, followed by a decrease or increase, respectively, reaching a value still different from baseline).The mean values at the start of the study, as well as at 6 and 12 months, for all the scales and individual items of the questionnaire are presented in the table.At 6 months, there was a significant deterioration in physical functioning and fatigue (QLQ-C30[+3]), as well as in social eating, swallowing, dry mouth, sticky saliva, taste/smell, and cough (H&N35).At 12 months, all symptoms improved, except for dry mouth, sticky saliva, and taste/smell, which remained significantly worse compared to baseline. Speech improved at 6 months, and pain did not change significantly.Emotional functioning gradually improved at 6 and 12 months, and mood, measured by the total CES-D score, improved at 6 months. There was a trend toward a lower percentage of patients with a CES-D score ≥ 16, but this did not reach statistical significance.

Scales/items EORTC QLQ-C30(+3)	0mois	6mois	12mois
Fatigue	19	26	23
Pain	13	14	10
Nausea and vomiting	3	5	3
Dyspnea	12	13	16
Insomnia	25	21	20
Appetite loss	8	12	8
Constipation	4	3	5
Diarrhea	2	3	4
Physical functioning	92	85	90
Emotional functioning	69	76	80
Cognitive functioning	86	88	88
Social functioning	85	89	90
Role activities	82	84	88
Global	74	77	77

Scales/items EORTC H&N35	0MOIS	6mois	12mois
Pain	15	16	12
Swallowing	13	17	10
Social contacts	5	5	4
Social eating	7	11	6
Speech	33	22	19
Taste/smell	4	15	9
Sexuality	17	14	13
Teeth problems	12	15	12
Trismus	3	3	3
Dry mouth	17	42	38
Sticky saliva	20	41	33
Cough	20	32	22
Feeling ill	14	15	12

Scales/items CES-D	0mois	6mois	12mois
Total score	12	9	10
Percentage with total score inf 16	28%	21%	18%

Discussion:-

This is a retrospective study on quality of life (QOL) conducted on a substantial number of laryngeal cancer patients treated with radiotherapy. By examining the baseline values of the EORTC QLQ-C30(+3) and comparing them to a reference sample from the general global population, our patients achieved comparable scores for almost all scales and individual items [18] . This likely reflects the absence of general physical symptoms, as measured by the QLQ-C30(+3), in our patient group. Head and neck-specific issues (particularly hoarseness) did not seem severe enough to influence cognitive and social functioning, professional activities, or overall quality of life. The only notable exception is the emotional functioning scale, for which our patient sample scored lower. It is evident that the EORTC H&N35 provided important specific information that was not captured by the EORTC QLQ-C30(+3), as also shown in a Scandinavian study, further highlighting the importance of adding cancer-specific modules to a general quality of life questionnaire for cancer patients. [13 ,19]

Physical functioning, fatigue, and many head and neck-related symptoms worsened at 6 months, with a trend toward improvement at 12 months. The only exception was speech, which improved at 6 months, likely due to the direct reduction in tumor size. It is likely that the magnitude of most differences between baseline and 6 months indicates clinically significant changes; a recent study on variations in QLQ-C30 scores classified differences of 5 to 10, 10 to 20, and greater than 20 as "mild," "moderate," and "very significant," respectively [20] . This pattern of temporary symptom deterioration after treatment has also been observed in other studies of head and neck cancer patients and is likely the result of treatment side effects [19 21 22] . The differences observed between patients with T1 tumors and those with T2 tumors at 6 and 12 months are likely related to differences in radiation fields and the total radiation dose. The influence of radiation fields and dose was also demonstrated in a cross-sectional study of 113 patients with T1–T4 laryngeal cancer, successfully treated with radiotherapy, where dry mouth was most pronounced in patients with T3–T4 tumors, 9 to 15 months after treatment. [23]

The permanent side effects of radiotherapy can lead to long-term morbidity. A cross-sectional study conducted on 66 patients with T1 laryngeal cancer revealed a surprisingly high number of physical complaints 2 to 6 years after radiotherapy, such as fatigue, muscle pain, frequent colds, dry mouth, mucus in the mouth or throat, hoarseness, cough, and throat tickling; many of these symptoms are likely related to radiotherapy. However, these complaints rarely resulted in restrictions in physical activities or psychosocial problems. In another cross-sectional study involving 27 patients with laryngeal cancer more than 5 years after radiotherapy, few physical deficits were observed, except for voice issues, which were not considered severe by the patients. A longer follow-up of our patient cohort will be needed to analyze the long-term effects of radiotherapy in a prospective manner [24].

At baseline, our patient group scored lower for emotional functioning compared to a reference sample [17]. The mean total CES-D score was also higher than the average scores (8.2, 7.9, 8.0, and 9.7, respectively) from four community samples in the Netherlands [25] . The percentage of patients with a score ≥ 16 in our study (28%) was also higher than in these samples (13%, 12%, 13%, and 19%, respectively). It is noteworthy that, despite physical deterioration, emotional functioning gradually improved, and depressive symptoms decreased. In another retrospective study of head and neck cancer patients using the EORTC QLQ-C30 and the Hospital Anxiety and Depression Scale, the same pattern was observed.[26]

Psychological distress appears to be common in patients with head and neck cancer, both at the time of diagnosis and after treatment [22 27 28] . However, many studies focus on patients with laryngeal and oropharyngeal cancer, where the impact of treatment on psychosocial functioning may be much more significant than in our patient group. In another retrospective study conducted on patients with oral or oropharyngeal cancer treated with surgery, with or without radiotherapy, we observed a more marked physical deterioration associated with an improvement in emotional functioning, while depressive symptoms remained stable (De Graeff, Oral Oncology, forthcoming).

An explanation for the divergence between physical deterioration on one hand and improvement in emotional functioning and depressive symptoms on the other could be as follows: at the start of the study, patients had just learned their diagnosis, were facing treatment, and had not yet had time to psychologically adapt to their new situation. Stress management and adaptation may be responsible for the improvement observed at 6 and 12 months.[29]

paradoxically, it has been shown in a sample of 55 head and neck cancer patients (including 30 laryngeal cancer patients) that, in the long term (more than 5 years after diagnosis), psychosocial functioning can deteriorate: although there was an improvement in physical problems, a perceived improvement in health, better management of health issues, and the belief that the disease is cured, a decrease in overall satisfaction, social relationships, and an increase in anxiety and anger were observed [21]. Thus, there may be a divergence between the positive changes occurring shortly after treatment and the negative changes in the long term. Prospective studies with prolonged follow-up are needed to address this issue.

The overall quality of life remained unchanged after 6 and 12 months, although a trend toward improvement was observed. Patients who reported an improvement in their overall quality of life at 6 months reported a better improvement in emotional functioning and a lesser increase in physical symptoms compared to patients who observed a decline in their overall quality of life. Apparently, for the entire group, the negative influence of physical deterioration was largely offset by the positive changes in emotional functioning and depressive symptomatology.

Conclusion:-

Radiotherapy for laryngeal cancer initially causes physical deterioration, primarily due to treatment side effects. Between 6 and 12 months after diagnosis, a clear improvement occurs. However, at 12 months, taste, smell, dry mouth, and sticky saliva remain worse than at baseline. Although there is a high level of depressive symptoms at baseline, emotional functioning and mood improve after treatment, despite physical deterioration. Adaptation mechanisms may play a role in this divergence. The long-term impact of the disease and its treatment on psychological functioning will need to be analyzed prospectively.

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