RESEARCH ARTICLE

Evaluation of Quality of Life in Turkish Patients with Head and Neck Cancer

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Abstract

Background: In this study, our aim was to investigate the effect of factors, such as radiotherapy, the dose of radiotherapy, the region of radiotherapy, the age of the patient, performance, co-morbidity, the stage of the disease and the therapy modalities on the quality of life of patients with head and neck cancer. Materials and Methods: Eighty-two patients who were treated by either chemoradiotherapy or radiotherapy, at the Cumhuriyet University Faculty of Medicine, Department of Radiation Oncology, between February 2007 and September 2010, for head and neck cancer were included. The quality of life European Organisation for Research and Treatment of Cancer, Questionnaire module to be used in Quality of Life assessments in Head and Neck Cancer (EORTC QLQ-H&N35) questionnaire was conducted in all patients before starting the radiotherapy, in the middle, at the end, at 1 month and at 6 months after the treatment. Results: According to the questionnaires at the end and at the 6th month after the radiotherapy, it was found that the age of the patient, co-morbidity, ECOG performance state, localization, type of treatment, the stage of the disease, the dose and the region of radiotherapy affect some of the symptom scales for quality of life. Conclusions: Quality of life was affected negatively during and after the radiotherapy. However, in the 6th month after the therapy, a significant improvement was observed in most symptoms.

Keywords: Chemoradiotherapy - head and neck cancer - life quality - radiotherapy

Asian Pac J Cancer Prev, **14 (8)**, 4805-4809

Introduction

The head and neck region is a small but important body part as far as the basic physiological functions, physical appearance, and social relations are concerned. Of all the cancers, 4-5% is the head and neck cancers, and 2% of all deaths due to cancer are caused by the head and neck cancers (Jemal et al., 2003). It has an increasing incidence, especially in the developing countries, being sixth among all cancers and the seventh in the causes of death due to cancer (Öztop, 2008). Approximately 90% of all these cancers are squamous cell carcinoma (Foote et al., 2007).

The main objective of the treatment of cancer patients is to obtain a tumor response and to increase the survival and/or the disease-free survival. However, nowadays, the successful results in cancer treatment comprise medical aspects as well as the psychosocial aspects of the disease. In patients with head and neck cancers, difficulties in basic human needs, such as feeding, respiration, and speech, which all affect the quality of life, are encountered. Depending on the chosen treatment modality, changes in the physical and functional abilities, social life, interactions within the family and in the psychological state will all have an impact on the quality of life.

Some studies suggested that semptom scales of quality of life were associated with survival (Osthus et al., 2011). Osthus et al. evaluated 139 head and neck cancer patients with EORTC QLQ-H&N35 in median follow-up 67 mounth. They have observed that survival of the patients was associated with semptom scales of feeling sick, less sexuality, openning mouth, swallowing problems and pain (Osthus et al., 2011).

In this study, our aim was to investigate, in particular, the effects of radiotherapy on the quality of life of patients with head and neck cancer.

Materials and Methods

The permission was obtained from Cumhuriyet University, Faculty of Medicine, Ethic Committee of Clinical Researches in order to conduct the study before it starts (Date/number:29.09.2010/179). Eighty-two patients who were treated by either chemoradiotherapy or radiotherapy, at the Cumhuriyet University Faculty of Medicine Department of Radiation Oncology between February 2007 and September 2010, due to head and neck

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cancer were included. The quality of life questionnaire (EORTC QLQ-H&N35: European Organization for Research and Treatment of Cancer, Questionnaire module to be used in Quality of Life assessments in Head and Neck Cancer) was applied to all patients before starting the radiotherapy, in the middle (15th or 20th fraction the radiotherapy), at the end, at 1 month and at 6 months after the treatment.

Before starting the radiotherapy, the performance states of the patients were scored according to the Eastern Cooperative Oncology Group (ECOG) Scoring System. The stage of the disease was evaluated according to the 2010 International Union against Cancer/ American Joint Committee on Cancer (UICC/AJCC) TNM Classification. The demographic and the histopathological data of the included patients were obtained from the patient files.

ECLIPS was used as the 3-dimensional conformal radiotherapy-planning program. Radiotherapy was generally given at six MV photon energy, and when indicated, at appropriate energies (9, 12, 16MeV, etc. electron). The radiotherapy was applied by the linear accelerator device. In the patients received radiotherapy alone, 66 Gy and more high radiation dose and 2 Gy/ day fraction dose were used. In the patients undergoing concurrent chemoradiotherapy, 66 Gy and more high radiation dose and 1.8-2 Gy/day fraction dose were used. In the patients treated radiotherapy after surgery and concurrent chemoradiotherapy after surgery, 50 or 60 Gy radiation dose and 2 Gy/day fraction dose were applied. But, 66 Gy radiation dose was also applied in the patients that have positive margin. In patients undergoing concurrent chemoradiotherapy, weekly cisplatin (40 mg/ m^2), or weekly cisplatin (25 mg/m^2) + docetaxel (25 mg/m^2) regimens were used. The patients that were not completed the radiotherapy were excluded in this study.

EORTC QLQ-H and N35 quality of life scale

A head and neck cancer scale, EORTC QLQ-H & N35, was developed in order to assess the quality of life of the patients with head and neck cancer better; in addition to the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ C-30) (Bjordal et al., 1994; Bjordal et al., 1999).

EORTC QLQ-H & N35 symptom scale contains a scale of eighteen symptoms.
The scores of responses to the questionnaire were between 0 and 100.

Evaluation-statistical analysis

For statistical analysis, Statistical Package for Social Sciences (SPSS) for Windows 14.0 program was used. For descriptive statistics mean, standard deviation, frequency, and median were used. To compare quantitative data among groups, Mann-Whitney U test, and for the comparisons within the groups Wilcoxon Signed Ranks Test were used. For the quantitative comparison of data in more than two groups, Kruskall-Wallis test was used. In comparisons of two groups, when there was a statistically significant relationship found in binary cases, according to the Kruskall-Wallis analysis, Mann-Whitney U test was used with Bonferroni correction. The results were evaluated at 95% confidence interval, and a p value of <0.05 level was defined as statistically significant.

Results

In this study, data from 82 patients (72 men (88%) and 10 women (12%)) were analyzed. The median age of the patients was 57 (min-max: 20-80) years. The median age of the men was 58, and the median age of the women was 44 years. There were statistically significant differences in terms of age distribution between the sexes (p=0.035).

Fifty-seven (70%) patients were smokers, 13 (16%) patients used alcohol, and 23 (28%) patients had co-morbidity. Performance states of patients were evaluated before starting the radiotherapy. Twenty-five (31%) patients had ECOG0, and 57 (67%) patients had ECOG1 performance state.

The squamous cell carcinoma was the most common type, and was seen in 75 (91%) cases. There were in 1 (1%) patients mukoepidermoid carcinoma, in 1 (1%) patient asinic cell carcinoma, in 2 (3%) patients mucosal malign melanoma, in 2 (3%) patients adenoid cystic carcinoma, in 1 (1%) patient malign mesenkimal tumor. There were 37 (45%) patients with laryngeal cancer, 16 (20%) patients with nasopharyngeal cancer, and 29 (35%) patients with a cancer of the oral cavity and oropharynx. The distribution of patients according to stages was: 7 (9%) patients had stage I, 21 (25%) patients had stage II, 22 (27%) patients had stage III, and 32 (39%) patients had stage IV disease.

In 17 patients (21%), radiotherapy alone was given. Twenty-two (27%) patients had concurrent chemoradiotherapy, 28 (34%) had radiotherapy after surgery, 15 (18%) had concurrent chemoradiotherapy after surgery. In the patients suffered surgery were performed 15 total laryngectomy, 11 partial laryngectomy, 6 partial glossectomy, 3 tonsillectomy, 8 complete excision of the mass. Additional, 30 patients were performed neck dissection (16 patients bilateral neck dissection and 14 patients unilateral neck dissection). The demographic characteristics of the patients are shown in Table 1.

The assessment of the quality of life

The QLQ-H & N35 questionnaire was applied before starting the radiotherapy, in the middle, at the end the radiotherapy and subsequently at 1 month and 6 months later. The consequently derived median values of the symptom scales, and the p-values are given in Table 2.

As seen in Table 2, in the middle, at the end the radiotherapy, one and six month after the treatment, compared to before starting the radiotherapy, all symptom scales of the quality of life were affected negatively (p<0,050). According to the questionnaire at the 6th month after the treatment, there was a decrease in the pain (p=0,042), in swallowing problems (p=0,001), in speech problems (p=0,020), in problems with eating in a social environment (p=0,002), in problems with socializing with other people (p=0,003), in feeling sick (p<0,001), in loss of sexual desire (p<0,001) and in weight loss (p=0,004). The patients were found to have gained weight (p<0,001). Due to the late side effects of the radiotherapy, there was a significant increase in dental problems (p<0,001), dryness

of the mouth (p<0,001), and the viscosity of the saliva (p<0,001).

Quality of life symptom scales at the end the radiotherapy

According to ECOG performance state and co-morbidity, there were no differences in terms of the symptom scales (p>0.05). When the patients were separated in two groups of over 65 years and below, weight gain (p=0.026) was seen more frequently in elderly patients. However, weight loss (p=0.006) and loss of sexual desire (p=0.041) were more common in younger patients. Other symptom scales were not statistically significant (p>0.05).

When the assessment was done according to the localization (larynx, nasopharynx, oral cavity and oropharynx), there were no statistically significant differences in the symptom scales (p>0.05), except for the dry mouth and the sticky saliva. Stickiness of saliva (p=0.007) and dry mouth (p=0.046) were significantly more frequent in the tumors of the nasopharynx, the oral cavity and the oropharynx, compared to the tumors of the larynx area.

When evaluated according to the stages, the stage I patients had an increased frequency of weight gain (p=0.035), whereas the stage IV patients were found to have increased sensory problems (p=0.022). All the symptom scales were affected negatively in all stages.

There were no significant differences between the groups in terms of the symptom scales of quality of life, when compared in terms of the type of treatment, such as radiotherapy alone, concurrent chemoradiotherapy, radiotherapy and concurrent chemoradiotherapy after surgery (p>0.05). However, according to radiation dose and radiation fields, there were differences in some symptom scales. Regarding the scale of the sensory symptoms, in the patients with irradiation of the tumor or tumor bed, the patients with added neck lymphatics were affected worse (p=0.008).

When the dose of radiotherapy was divided into two groups as ≤60Gy, and >60Gy; the group with a radiation >60 Gy was affected more in terms of shortage of social interaction (p=0.034), speech problems (p=0.028), eating in social environment (p=0.046), the problems of opening the mouth (p=0.006), sticky saliva (p=0.015), feeling sick (p=0.035), weight loss (p=0.029) and additional nutrient

Table 1. Demographic Distrubution of Patients

		No. of patient	%
Sex	Male	72	88
	Female	10	12
Age	<65 age	58	71
	≥65 age	24	29
Comorbidity	No	59	82
	Yes	23	28
Performance Status	ECOG 0	25	31
	ECOG 1	57	69
Lokalization	Larynx	37	45
	Nasopharynx	16	20
	Oral cavity ve oropharynx	29	35
Stage	I	7	9
	II	21	25
	III	22	27
	IV	32	39
Treatment	Radiotherapy	17	22
	Chemoradiotherapy	22	29
	Surgery+radiotherapy	24	32
	Surgery+chemoradiotherapy	17	17
Doses of radiotherapy	≤60	27	36
	>60	49	64
Radiotherapy field			
Tumor or the tumor bed		11	14
Tumor or the tumor bed+neck lymphatics		67	86
Surgery	Total laryngectomy	15	35
	Partial laryngectomy	11	25
	Partial glossectomy	6	14
	Tonsillectomy	3	7
	Complete excision of the mass	8	19
	Neck dissection	30	70

Table 2. The Median Values of the Symptom Scales and the p values before Starting the Radiotherapy, the Middle and the End of the Radiotherapy, and the Values at One Month and Six Months Later

CQLQ-H&N35 Scala	Before starting RT* The median	Mid RT The median (value of p**)	End of RT The median (value of p**)	One month after the RT The median (value of p**)	Six months after the RT The median (value of p**)
Pain	8.3	50 (<0.001)	75 (<0.001)	37.5 (<0.001)	0 (0.042)
Swallowing problems	25	66.6 (<0.001)	91.6 (<0.001)	66.6 (<0.001)	8.3 (0.001)
Sensory problems	0	50 (<0.001)	83.3 (<0.001)	66.6 (<0.001)	16.6 (0.322)
Speech problems	22.2	66.6 (<0.001)	88.8 (<0.001)	55.5 (<0.001)	11.1 (0.020)
Social eating	33.3	66.6 (<0.001)	100 (<0.001)	66.6 (<0.001)	0 (<0.002)
Social contact	26.6	66.6 (<0.001)	100 (<0.001)	56.6 (<0.001)	0 (0.003)
Less sexuality	66.6	100 (<0.001)	100 (<0.001)	66.6 (<0.013)	0 (<0.001)
Teeth problems	0	33.3 (<0.001)	33.3 (<0.001)	33.3 (<0.001)	33.3 (<0.001)
Openning mouth problems	0	33.3 (<0.001)	66.6 (<0.001)	33.3 (<0.001)	0 (0.615)
Dry mouth	0	66.6 (<0.001)	100 (<0.001)	100 (<0.001)	33.3 (<0.001)
Sticky saliva	0	66.6 (<0.001)	100 (<0.001)	83.3 (<0.001)	33.3 (<0.001)
Coughed	0	33.3 (<0.001)	66.6 (<0.001)	33.3 (<0.001)	0 (0.735)
Feeling ill	33.3	66.6 (<0.001)	100 (<0.001)	33.3 (<0.001)	0 (0.001)
Painkillers	0	100 (<0.001)	100 (<0.001)	100 (0.086)	0 (0.127)
Nutritional supplement	0	100 (<0.001)	100 (<0.001)	100 (0.020)	0 (<0.001)
Feeding tube	0	0 (0.004)	0 (0.004)	0 (0.705)	0 (0.180)
Weight loss	100	100 (<0.001)	100 (<0.001)	0 (<0.001)	0 (0.004)
Weight gain	0	0 (1.000)	0 (0.655)	100 (<0.001)	100 (<0.001)

intake (p=0.030).

Quality of life symptom scales 6 months after the radiotherapy

There was no difference in the symptom scales in terms of ECOG, the presence of co-morbidity, age (≥65 years old), and treatment regimens (radiotherapy, concurrent chemoradiotherapy and radiotherapy and concurrent chemoradiotherapy after surgery) (p>0.05). In patients with nasopharyngeal cancer sticky saliva (p=0.031), dry mouth (p=0.022) and dental problems (p=0.019) were more common than the other localizations. There were an increased number of dental problems (p=0.041) in patients with stage III disease, compared to the other stages. In patients with a radiation dose >60 Gy, pain (p=0.042) and dry mouth (p=0.029) were seen more than the other dose. As to the area of irradiation, sticky saliva (p=0.005) and dental problems (p=0.005) were seen more frequently in patients irradiated at the tumor or the tumor bed and the lymph node.

Discussion

In patients with head and neck cancers, surgery, radiotherapy, and chemoradiotherapy are treatment modalities which vary depending on the clinical stage, the localization, and the patient selection. Each of these treatment modalities has different effects on the patient's quality of life. Surgical treatment can cause tissue defects in patients resulting in changes in appearance, and sometimes can lead to loss of function. Radiation therapy has both acute (mucositis, eosophagitis, etc.) and late (fibrosis, xerostomia, etc.) side effects, which can all affect the quality of life of the patients.

Aplak et al. (2007) found poor values for pain, problems with consuming food in a social environment, loss of taste, the problem of opening the mouth and trismus in the EORTC-QLQ-C30 and QLQ H&N35 questionnaires applied to 102 patients with head and neck cancers. They found low scores for swallowing problems in patients with pharyngeal cancer and for speech problems in patients with laryngeal cancer.

In our study, when the symptom scores were compared at the end the radiotherapy in terms of localization, there were only differences in sticky saliva and dry mouth. In the nasopharynx and oral cavity tumors, sticky saliva and dry mouth were encountered more frequently compared to the laryngeal cancer. In the questionnaire 6 months after radiotherapy, there was a statistically significant difference in salivary stickiness, dryness of the mouth and dental problems in nasopharynx cancer.

An impaired quality of life may be expected in patients with ECOG performance state or co-morbidity. However, in our study, we found no impaired quality of life in patients with ECOG performance state or co-morbidity. All of our study group had got ECOG0 and ECOG1, symptom scales of quality of life were same each other in these patients. Presumably, there was a difference if performance state were more higher than ECOG1. There was also no difference in the questionnaire at six months after radiotherapy. There were similar findings in patients over 65 years of age. Weight loss and loss of sexual desire were more common in patients younger than 65 years, whereas weight gain occurred more frequently in patients over the age of 65. However, no differences were found in the questionnaire after six months.

In their study in patients with advanced stage cancer, Campbell et al. (2000) found higher scores for swallowing problems, speech problems, and physical activity challenges. Similarly, Aplak et al. (2007) observed better scores in patients in stage I and II, compared to the patients in stage III and IV. In patients with Stage III and IV tumors, the scores were higher for fatigue, dyspnea, insomnia, loss of consciousness, swallowing difficulties, social communication, loss of taste/smell, whereas in patients with stage I and II tumors, the scores were better for physical function (Bjordal et al., 1994). Our results were slightly different from these studies. We found significant increases in weight in stage I, and in sensory problems in stage IV. None of the other symptom scales were affected by stage of disease.

Kim et al. (2010) evaluated 133 oropharyngeal cancer patients treated with surgery and radiotherapy, by means of EORTC QLO-C30 and HN65 questionnaires. In the group receiving radiation therapy, the symptom scores were high for dry mouth, difficulty in weight gain and the use of analgesics. In the group with surgical treatment, the symptom scores were slightly better. Boscolo-Rizzo et al. (2009) used EORTC QLQ-C30 and H&N35 questionnaires in 57 patients with T3-4 oropharyngeal cancer, to compare 31 patients receiving concurrent chemoradiotherapy after surgery with 26 patients receiving radiotherapy. The group with chemoradiotherapy had better scores in fatigue, pain, swallowing problems, eating problems in social environment, inability to build social interaction, whereas disadvantages were found in terms of dental problems, the problem of opening the mouth, dry mouth and sticky saliva (Boscolo-Rizzo et al., 2009).

Tschudi et al. (2003) investigated the QOL after three different treatment modalities. The groups comprised of 31 patients with only surgery, 19 patients with radiotherapy alone and 49 patients with radiotherapy after surgery. The patients without radiotherapy had significantly less complaints about swallowing difficulties, eating problems in a social environment, lack of social interaction, dry mouth, sticky saliva and difficulties with opening the mouth.

Aplak et al. (2007) compared symptom scales in patients receiving only radiotherapy, concurrent chemoradiotherapy and radiotherapy after surgery. When the scores in different treatment modalities were compared, better scores were found for physical and emotional function and quality of life in the group with only radiotherapy. In the group with radiotherapy after surgery, the scores for fatigue, pain, insomnia, weight loss, speech and swallowing problems, dyspnea, lack of social interaction were found to be significantly higher. Surgery was found to increase survival, but the level of performance and the quality of life were affected negatively due to the permanent functional and physical changes. In the same study, in the radical surgery group, there were high scores for the swallowing and the speech

problems, insomnia, dyspnea, sensory problems and social communication problems (Aplak et al., 2007).

In our study, when the patients were divided into four different groups according to the treatment received, i.e. radiotherapy alone, concurrent chemoradiotherapy, radiotherapy after surgery and concurrent chemoradiotherapy after surgery, there were no difference in symptom scales at the end the radiotherapy and six months after the radiotherapy. A number of the patients of the treatment groups was small. If there were more patients, this results could be different. Hence, same studies need to be investigated by large series.

All symptom scales were significantly disrupted at the end the radiotherapy, whereas all of them improved after 6 months. We also compared the quality of life symptom scales, according to the radiation dose and the region of the radiation therapy. At the end the radiotherapy, the shortage of social interaction, speech problems, eating in social environment, the problems of opening the mouth, sticky saliva, feeling sick, weight loss and additional nutrient intake were more prominently affected in the group an irradiation dose of ≥60 Gy. In the questionnaires after 6 months, pain and dry mouth was seen more frequently in patients receiving ≥60Gy dose of radiotherapy. Due to the large irradiation area, in patients treated with irradiation of the tumor or tumor bed together with the neck lymphatics, the scores for the sensory problems were high at the end the radiotherapy; and the scores for sticky saliva and dental problems were higher after 6 months.

Ackerstaff et al. (2011) applied EORTC QLQ-C30 and H&N35 questionnaires in 236 patients with head and neck cancer, treated with concomitant intra-arterial and intravenous chemoradiotherapy. The questionnaires were administered before the treatment and 7 weeks, 3 months, 1, 2, and 5 years after the treatment. They have observed that most scores were deteriorated during the treatment, but all symptoms scales except for xerostomia were improved after one year and all remained stable. In the living patients, fatigue, speech, and swallowing scores were positive.

In our study, during and at the end the radiotherapy and 1 month after the treatment, all symptom scales were impaired significantly. However, six months after the end of the radiotherapy, except for dry mouth, sticky saliva, dental problems and sensory problems, all symptom scores returned to normal. In fact, symptoms such as pain, swallowing difficulties, feeling sick, difficulties with eating in a social environment, difficulties with social interaction and weight loss showed improvement from baseline, and the patients have even gained weight.

In conclusion, in the short term, radiotherapy has a negative effect on the quality of life of patients with head and neck cancers during and after the treatment. However, when the quality of life in the long term was compared to that before starting the radiotherapy, there was a significant improvement. Next to the radiotherapy, field of radiotherapy, dose, treatment method and patient's age, the performance state and the presence of co-morbidity did not affect the quality of life of much.

With a close monitoring of acute side effects and the implementation of appropriate symptomatic treatments, quality of life of patients during treatment can be increased. However, during the planning of the radiotherapy, better protection of organs such as the salivary glands will ensure reducing late side effects, and thus may increase the patients' quality of life.

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