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Quality of life of Indian head and neck cancer patients before and after treatment: A prospective study from a tertiary cancer center

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ABSTRACT

Background: Health-related quality of life (HRQoL) is defined as a specific subset of QoL, assessing symptoms, psychological aspects, and function. It is very important for healthcare professionals to recognize the issue-related to the QoL of head and neck cancer patients. **Aims and Objectives:** This study intended to measure different domains of QoL in head and neck cancer patients before and at the time of radiotherapy (RT) treatment completion, 3 and 6 months after treatment completion, and to discover the relationship between the type of treatment and QoL. **Materials and Methods:** An assessment of pre- and post-RT QoL of sixty head and neck cancer patients was done at our RT department, using the European Organization for Research and treatment of cancer QoL questionnaire head and neck cancer module (EORTC QLQ H&N 35). **Results:** Statistically significant differences were observed compared to baseline ($P < 0.001$) at the completion of radiotherapy in pain, swallowing, speech, cough, dry mouth, mouth opening, and senses scale and at 3.6 months of follow-up, while the HNSS (sticky saliva) scale showed statistically insignificant result at Zero (0) months (at the time of completion of radiation). **Conclusion:** The results of our study showed that QoL in head and neck carcinoma patients is affected in various functional and symptoms-related domains and their overall health and QoL perceived were not very satisfactory. These post-treatment-related complications were not preventable and should be talked about with the patients before starting RT.

Key words: Quality of life; Head and neck cancer; Radiotherapy

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INTRODUCTION

Many head and neck cancer patients in India have been diagnosed in locally advanced stages and treated with radiotherapy (RT) or concurrent chemoradiotherapy (CRT).[1-3] The availability of advanced Radiotherapy techniques resulted in better survival and cure for patients with head and neck carcinoma but has also induced challenges related to the acute and late sequel of treatment (RT/CRT).[3] Oncologists can observe some of this post-treatment toxicity objectively, but many of them can only be experienced and measured by patients themselves. Quality of life (QoL) questionnaires to measure symptoms of both the disease and post-treatment toxicity gives the patients a structured tool for expression of sufferings and provide health caregivers and nursing personnel valuable information regarding further care. This ultimately would enhance the understanding of patients' burden in the development of newer treatment techniques.

Health-related QoL (HRQoL) is defined as a specific subset of QoL, assessing symptoms, psychological aspects, and function.[4] The overall HRQoL in patients with head and neck cancer has been assessed in several studies using the validated EORTC QLQ-C30 and QLQ-H&N 35 instruments.[5,6] Results from the previous studies on

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HRQoL have shown that most of the patient's function, symptoms, and global health scales show deterioration after RT and then improvement by 3 and 6 months after RT completion.[7,8] Some symptoms including xerostomia, changes in taste and smell, sticky saliva, and deterioration in physical functioning are remaining up to 12 months after completion of RT. A review of the literature on patient-reported late side effects of RT from 12 months to 5 years after completion of treatment showed worsening of sticky saliva, nausea, and trismus.[8] The QoL deteriorated significantly during treatment followed by a slow recovery until one to 3 years follow-up with a few exceptions such as senses dry mouth and sexuality.[9,10] The sequelae of RT and CRT can impair the physical wellness of patients.

Giving support to the patients after RT is an important responsibility of both treating oncologists and the public health nurse. It is very important for health-care professionals to recognize the issue-related to QoL of head and neck cancer patients.

Aims and objectives

This study intended to measure different domains of QoL in head and neck cancer patients before and at the time of RT treatment completion, 3 and 6 months after treatment completion, and to find the relationship between the type of treatment and QoL.

MATERIALS AND METHODS

Ethical consideration

This study was approved by the Institutional Ethics Committee of NRS medical college (no-NMC/7831 dated 07/12/2017). All the participants were told that anyone can drop out anytime, and assured of confidentiality, and anonymity. The purpose of the study was fully explained to all the participants, and written informed consent had been taken before inclusion in the study.

Study design

This was a single institutional prospective and longitudinal study. This study was carried out in the department of RT at NRS Medical College and Hospital, Kolkata. The inclusion criteria were histologically confirmed Head and neck cancer patients (1) of age between 18 and 70 years; (2) Eastern Cooperative Oncology Group-Performance Status (ECOG-PS) of 0–2; and (3) patients willing to give written informed consent voluntarily. The exclusions criteria were (1) previous history of the treatment of cancer, (2) The ECOG-PS of 3 or more, (3) patients with other comorbidities such as uncontrolled DM and hypertension; and (4) not willing to give voluntary consent for this study.

Procedure

A total of 60 histologically proven squamous cell carcinoma of the head and neck were selected according to inclusion and exclusions criteria as mentioned earlier. Out of 60 patients, 43 patients received concurrent chemoradiation, and the rest 17 patients only RT with a dose of 66Gy/33# over 6½ weeks. Inj. Cisplatin was given as concurrent chemotherapy at a dose of 40 mg/m^2 weekly for six cycles.

Data collection

After fulfilling the selection criteria, an assessment of pre- and post-RT QoL in patients of head and neck cancer patients was done at our RT department, using the European Organization for Research and treatment of cancer QoL questionnaire head and neck cancer module (EORTC QLQ H&N 35). EORTC, QoL questionnaire core 30 items (EORTC QLQ-C30) including H&N -35 module, is the most commonly used and tested QoL tool in the field of RT. The H&N questionary deals with specific head and neck cancer symptoms and the side effects of treatments. It has 35 questions grouped into seven scales: pain, swallowing, senses, speaking, eating in the company of others, social contacts, sexuality, and 11 individual questions concerning teeth problems, difficulties with opening the mouth, oral cavity dryness, the presence of thick saliva, coughing, awareness of the illness, taking pain killers, using food supplements, and losing or gaining weight. There is a four-degree scale in the answers to the questions in the questionnaire.

Data analysis

All the patients were assessed using the European Organization for Research and treatment of cancer QoL questionnaire head and neck cancer module (EORTC QLQ H&N 35) before radiation and post-radiation. They were asked to mark all the questions on a scale of 1 to 4. The four points denoted: 1=Not at all, 2=Very little, 3=Quite a bit; 4=Very much. All the patients followed up weekly during RT then at treatment completion, at the 3,6-month intervals, and were assessed with regard to the European Organization for Research and treatment of cancer QoL questionnaire head and neck cancer module (EORTC QLQ H&N 35). The scoring was done as per the EORTC scoring manual as described below: Raw sore (RS) was calculated by the average of the items on a particular scale (for example, pain includes four points and the raw score for pain was calculated as a sum of the score for point1 to 4 divided by 4). The score was obtained by applying a linear transformation from 0 to 100. The range is the difference between RS's maximum and minimum possible value. Most items were scored 1–4 giving a range of 3. The mean median and standard deviation of the score were calculated.

RESULTS

A total of 60 patients with histopathologically proven locally advanced head and neck cancers were recruited from January 2018 to January 2020. The patients were selected according to the inclusion and exclusion criteria mentioned earlier. Patients received radiation up to a dose of 66 Gy/33 fractions, 2 Gy/fraction, and 5 fractions/week over 7 weeks with or without chemotherapy, cisplatin (40 mg/m^2/week) for six cycles. Out of 60 patients, 43 patients received concomitant chemoradiation (CTRT) and 17 patients received radiation only. Patients included in the study ranged from 45–70 years and the mean age (±SE) was 56.32±0.826. Out of 60 patients who participated in this study, 47 patients were male and 13 were female patients. The patients from the four sites of the head and neck region – oral cavity, oropharynx, hypopharynx, and larynx were included in the study. Out of 60 patients, 27 patients were Stage IVA, 23 patients were Stage III, and ten patients were Stage II.

Symptom scales of the European Organization for Research and treatment of cancer QoL questionnaire head and neck cancer module (EORTC QLQ-H&N35, 0–100-point scale) from baseline, that is, before RT and over 6 months were recorded. Mean values are based on patients answering the questionnaire. Higher scores indicate more severe symptoms or impairments. Statistically significant differences compared to baseline. The pain scale (HNPA) is a clinical scale that consists of four items regarding pain in the mouth, pain in the jaw, soreness in the mouth, and painful throat (hn1 to hn4 respectively). The last item showed low correlations with its, own scale (scaling errors) for most of the sub-analyses and somewhat higher correlations with the swallowing scale, which makes clinical sense. Patients may have pain in the throat without having pain in the mouth, but if the patient reports pain in the throat, likely, swallowing problems are also present. However, we believed that it was important to retain this item in the pain scale to have a measure of pain in patients with hypopharyngeal and laryngeal cancer, and the unchanged scale was therefore used in the following analyses. The mean score for pain pre-radiation for 60 patients was 51.10, which gradually increased during treatment and at 0 months following treatment. During the 3rd and 6th follow-up, there was a significant decrease in pain score reaching a mean of 24.71 in the 6th month. Comparing mean values of pain symptoms between patients receiving only radiation and patients receiving chemoradiation showed no significant difference at 0 and 6th months (P=0.146 and 0.734, respectively), whereas there was a significant difference at 3 months (P=0.028).

The HNDR scale (dry mouth) comprises only one item (HNDR, 11) score of 1–4. Analysis reveals patients experienced dryness of mouth following radiation which continued to be worrisome even after 6 months of treatment. Mean values at pre-treatment were 22.22, maximum at 0 months 62.21, 55.55 at 3rd months, and 41.10 at 6th month follow-up. HNDR was found to be equally affected in patients irrespective of treatment type.

The swallowing scale (HNSW) includes four items that assess different degrees of swallowing problems: problems swallowing liquid, pureed food, or solid food, and choking when swallowing (hn5 to hn8, respectively). There were no scaling errors in this scale. Patients experienced maximum difficulty in swallowing during and at 0 months of radiation which gradually decreased.

The nutrition scale includes seven items that assess various symptoms related to the oral cavity: problems with the teeth (hn9) HNTE, problems opening the mouth (hn10) HNOM, dry mouth (hn11) HNDR, sticky saliva (hn12) HNSS, problems with the sense of smell (hn13) or taste (hn14), and trouble eating (hn19). Problem with smell and taste (hn13 and hn14, respectively) forms a separate scale named the scale of the senses (HNSE). The item that assesses trouble eating (hn19) had scaling errors in all subgroups.

Statistically significant differences were observed compared to baseline ($p < 0.001$) at the completion of RT in pain, swallowing, speech, cough, dry mouth, mouth opening, and senses scale and at 3 and 6 months of follow-up, while the HNSS (sticky saliva) scale showed statistically insignificant result at 0 months (Table 1). On comparing the P values of the different symptom scales between patients receiving only RT and CTRT, no significant difference was found except in the pain (HNPA) scale. Patients receiving CTRT perceived more pain, which was possibly due to increased radiosensitization with cisplatin (details depicted in Table 2). On comparing all symptom scores together for all patients, the dry mouth (HNDR) and sticky saliva (HNSS) scale continued to be worrisome even after 6 months of treatment. Almost all other symptom scores decreased to a pre-RT level at the 6-month follow-up.

The use of painkillers ranged from 20 to 80%, maximum during and at 0 months of RT. Weight loss was maximum at 0 months of RT at 91.66%, while weight gain occurred in only 38 patients at 6 months of RT (Table 3).

DISCUSSION

As indicated by GLOBOCAN 2020, head and neck cancer was a widely recognized threat among men in India.[1] Carcinoma

Table 1: Comparison of different quality of life parameters between baseline and post-radiation (RT) at 0, 3rd, and 6th-month follow-up.

Symptoms	Pre-RT (mean±SE)	0-month post-RT (mean±SE) Sig. (2-tailed)	3 months post-RT (mean±SE) Sig. (2-tailed)	6 months post-RT (mean±SE) Sig. (2-tailed)
Pain (HNPA)	51.10±1.54	63.19±1.70 <0.001	36.10±1.50 <0.001	24.71±1.28 <0.001
Swallowing (HNSW)	33.19±1.44	64.02±1.63 <0.001	36.38±1.52 0.131	17.77±1.03 <0.001
Teeth (HNTE)	21.10±2.09	59.99±3.24 <0.001	48.32±2.15 <0.001	17.77±2.16 0.270
Sticky saliva (HNSS)	13.33±2.12	16.66±2.16 0.275	43.32±1.98 <0.001	74.44±2.78 <0.001
Speech (HNSP)	12.59±1.55	38.09±2.01 <0.001	51.05±2.92 <0.001	22.77±2.03 <0.001
Cough (HNC0)	16.10±2.16	33.88±2.44 <0.001	57.77±2.72 <0.001	33.33±3.96 <0.001
Dry mouth (HNDR)	22.22±2.04	62.21±3.83 <0.001	55.55±2.04 <0.001	41.10±1.83 <0.001
Feeling ill (HNFI)	43.32±1.98	72.21±2.76 <0.001	41.10±1.83 0.413	29.99±1.89 <0.001
Mouth opening (HNOM)	72.21±2.98	42.21±1.91 <0.001	29.44±1.95 <0.001	8.88±1.91 <0.001
Senses (HNSE)	12.21±1.62	73.05±2.53 <0.001	52.49±2.19 <0.001	31.66±1.16 <0.001

of the head and neck is more common in men and are mainly due to indiscriminate use of tobacco in various forms and alcohol. Approximately 80 % of head and neck (H&N) cancer patients in developing nations as Stage III and IV disease and around 40 % of these patients are suitable only for palliative RT.[11,12] In an attempt to improve the prognosis, concurrent CRT was introduced, where RT acted as a radiosensitizer.[13] The CTRT improves locoregional disease control and survival due to additive or synergistic effects of chemoradiation.[13] The results of this study show an overall decrease in QoL after RT and a fast recovery during the follow-up period. Several symptoms and functions deteriorated significantly by the end of RT, and then gradually improved by 3 and 6 months to reach baseline levels 6 months after completion of RT. However, at 6 months after completion of RT, there were remaining significant problems in senses, dry mouth, and sticky saliva. Comparing mean values at the end of treatment to the values found at treatment onset in the QLQ-H&N35 (QoL questionnaire head and neck cancer module) questionnaire assessment, there is an increase in dry mouth and saliva viscosity with significant swallowing impairment.[13] The increase in nausea and vomiting symptoms, loss of appetite, and constipation (feeling ill, HNFI) seen during the middle of the treatment may be associated with the appearance of the classic radio and chemo-induced acute effects.[4,5] Another common complication is dysgeusia (distorted or impaired sense of taste) affecting up to 75% of patients. There was a reduction in taste and olfaction in the three periods assessed (73.05, 52.49, and 31.66, respectively, with a sig 2 tailed).[3-5]

In our study, the pain was present at the 3 months of assessment, with a similar response to questionaries and it is predominant in the middle of the treatment and decreases at the end. The high standard deviation from the mean suggests a large variability in its perception. The increase in pain during treatment may be due to adverse opportunistic lesions arising from radiation-induced mucositis, which may also justify the increases in analgesic use. Pain is a common problem in patients with H&N cancer. It may be a consequence of the curative treatment modality, and attributable to physical, and psychological sufferings. Changes in taste, olfaction and are associated with trismus, and feeding-related social difficulties may have contributed to the increasing use of food supplements. Maintenance of Proper nutrition through the therapy is very important and sometimes needs to be stimulated and facilitated.

The assessments of the QoL of cancer patients are very complex and have a large number of variables, from their social situation, all the way to the very particularities of their disease, which may also impact patients' self-perception. It encompasses individual assessment characteristics, which do not depend on the patient's system of belief, values, and even physical strength. Cure and tumor control have been the focus of H&N cancer management, with less focus on QoL and rehabilitation. In our daily, clinical duty improvement of quality assessment of oral function during and after treatment are needed to manage oral function and prevent late sequelae. The remaining chronic problem in senses, dry mouth and sticky saliva were observed in our study and these findings are very similar to Blanco and González-Botas.[14] Good communications and access to HRQoL data may also play a role in the QoL issue in H&N cancer patients. There is also an indication of a positive

Table 2: Comparison of quality-of-life parameters between CTRT and only RT

Group statistics						
	Treatment	N	Mean	Standard deviation	Standard error mean	P-value
Pain (HNPA)	CTRT	43	61.6253	13.25737	2.02173	0.146
Month 0	RT	17	67.1547	12.66408	3.07149	
Pain (HNPA)	CTRT	43	38.1749	11.95588	1.82325	0.028
Month 3	RT	17	30.8794	9.20623	2.23284	
Pain (HNPA)	CTRT	43	24.9963	9.79317	1.49344	0.734
Month 6	RT	17	24.0159	10.57507	2.56483	
Swallowing (HNSW)	CTRT	43	62.9819	12.76983	1.94738	0.316
Month 0	RT	17	66.6641	12.50167	3.03210	
Swallowing (HNSW)	CTRT	43	36.2372	10.73904	1.63769	0.878
Month 3	RT	17	36.7629	14.44996	3.50463	
Swallowing (HNSW)	CTRT	43	16.6623	6.80492	1.03774	0.089
Month 6	RT	17	20.5847	10.25670	2.48762	
Dry mouth (HNDR)	CTRT	43	60.4579	29.32773	4.47244	0.471
Month 0	RT	17	66.6641	31.18204	7.56275	
Dry mouth (HNDR)	CTRT	43	56.5835	15.48848	2.36197	0.426
Month 3	RT	17	52.9359	16.90830	4.10086	
Dry mouth (HNDR)	CTRT	43	41.8563	14.71458	2.24395	0.521
Month 6	RT	17	39.2118	13.09711	3.17652	
Feeling ill (HNFI)	CTRT	43	71.3135	21.30998	3.24974	0.607
Month 0	RT	17	74.5059	22.14248	5.37034	
Feeling ill (HNFI)	CTRT	43	40.3060	13.71946	2.09220	0.492
Month 3	RT	17	43.1329	15.65404	3.79666	
Feeling ill (HNFI)	CTRT	43	31.0047	15.24833	2.32535	0.401
Month 6	RT	17	27.4482	13.09711	3.17652	
Senses (HNSE)	CTRT	43	74.8028	18.67849	2.84844	0.277
Month 0	RT	17	68.6241	21.95588	5.32508	
Senses (HNSE)	CTRT	43	53.0960	16.36718	2.49597	0.668
Month 3	RT	17	50.9765	19.06643	4.62429	
Senses (HNSE)	CTRT	43	30.6163	9.57635	1.46038	0.156
Month 6	RT	17	34.3106	7.14720	1.73345	
Teeth (HNTE)	CTRT	43	58.1342	25.29525	3.85749	0.367
Month 0	RT	17	64.6982	24.91893	6.04373	
Teeth (HNTE)	CTRT	43	48.0572	16.74784	2.55402	0.844
Month 3	RT	17	49.0147	17.14814	4.15904	
Teeth (HNTE)	CTRT	43	17.8277	16.82114	2.56520	0.970
Month 6	RT	17	17.6453	17.14814	4.15904	
Mouth opening (HNMO)	CTRT	43	41.0812	14.24733	2.17270	0.350
Month 0	RT	17	45.0935	16.41810	3.98197	
Mouth opening (HNMO)	CTRT	43	30.2295	15.95793	2.43356	0.526
Month 3	RT	17	27.4482	13.09711	3.17652	
Mouth opening (HNM0)	CTRT	43	10.8516	15.80300	2.40993	0.104
Month 6	RT	17	3.9212	11.06908	2.68465	
Sticky saliva (HNSS)	CTRT	43	15.5023	16.82114	2.56520	0.399
Month 0	RT	17	19.6059	16.90830	4.10086	
Sticky saliva (HNSS)	CTRT	43	42.6314	15.12683	2.30682	0.581
Month 3	RT	17	45.0935	16.41810	3.98197	
Sticky saliva (HNSS)	CTRT	43	72.8642	22.13162	3.37504	0.373
Month 6	RT	17	78.4276	20.21395	4.90260	
Speech (HNSP)	CTRT	43	34.8802	17.74645	2.70631	0.521
Month 0	RT	17	31.3694	21.95290	5.32436	
Speech (HNSP)	CTRT	43	58.1349	21.93435	3.34496	0.835
Month 3	RT	17	56.8576	19.59500	4.75249	
Speech (HNSP)	CTRT	43	29.4549	27.41773	4.18116	0.121
Month 6	RT	17	43.1347	36.82596	8.93161	
Cough (HNCO)	CTRT	43	37.3970	15.67650	2.39064	0.587
Month 0	RT	17	39.8524	15.72715	3.81439	
Cough (HNCO)	CTRT	43	48.2642	22.57186	3.44218	0.130
Month 3	RT	17	58.1253	22.04029	5.34555	
Cough (HNCO)	CTRT	43	26.8656	17.00223	2.59282	0.328
Month 6	RT	17	21.5665	22.72483	5.51158	

CTRT: Concomitant chemoradiation, RT: Radiation

Table 3: Single items of H&N module 35 of the European Organization for Research and treatment of cancer (EORTC) scale quality of life (number, %) (1-No, 2-Yes)

Items	Extent	Pre-RT	0 month	3 months	6 months
HNPK (pain killer)	1	17	12	21	31
		28.33%	20%	35%	51.66%
	2	43	48	39	29
		71.66%	80%	65%	48.33%
HNWL (weight loss)	1	29	5	25	31
		48.33%	8.33%	41.66%	51.66%
	2	31	55	25	9
		51.66%	91.66%	41.66%	15%
HNWG (weight gain)	1	0	55	53	22
			91.66%	88.33%	36.66%
	2	60	5	7	38
		100%	8.33%	11.66%	63.33%

therapeutic effect on HRQoL in H&N cancer patients who experience that their physician has access to QoL data and used this information in their communication.[15] Perception of complications of RT was investigated after RT showed that lethargy, weakness, dry mouth, sores pain, teste change, and sore throat were the most debilitating side effects.[16]

Limitations of the study

Our study is a single institutional one and may not be representative of the whole population.

CONCLUSION

The results of our study showed that QoL in head and neck carcinoma patients is affected in various functional and symptoms-related domains and their overall health and QoL perceived were not very satisfactory. The variables such as age, a subsite of the disease, type of therapy, and history of addiction have some impact on QoL. These post-treatment-related complications were not preventable and should be talked about with the patients before starting RT. Pre- and post-treatment guidance may help patients to adapt better to these long-term symptoms and, therefore, may enhance HRQoL results. Detailed follow-up is important if healthcare providers are to succeed in supporting specific needs at a specific time in the patient's recovery.

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