ORIGINAL ARTICLE

Evaluation of Oral Health Related Quality of Life in Patients Diagnosed with Head and Neck Cancer Receiving Radiotherapy

SHAHIDA MAQBOOL[1], SOBIA SIDDIQUE[2], AYESHA MEHAK[3], QAISER ALI[4], SYEDA KINZA ASGHAR[5], FAIZA SHAHID[6]

[1]Assistant Professor Department of Oral Medicine, HBS Medical & Dental College, Islamabad
[2]Assistant Professor Department of Oral Pathology, HBS Medical & Dental College, Islamabad
[3,4]Demonstrator Department of Orthodontics, HBS Medical & Dental College, Islamabad
[5,6]Demonstrator Department of Periodontology, HBS Medical & Dental College, Islamabad
Correspondence to: Dr. Shahida Maqbool, Email: shahidamaqbool@hotmail.com, Cell: +92 318 4342032

ABSTRACT

Objective: To evaluate the oral health related quality of life in patients diagnosed with head and neck cancer receiving radiotherapy.
Design of the Study: It's a case control study.
Study Settings: The study was conducted at department of Oncology Holy Family Hospital, Rawalpindi and District Headquarters Hospital, Rawalpindi from Feb 2021 to Sep 2021.
Material and Methods: Total 300 patients aged 18 years and above diagnosed with head and neck cancer undergoing radiotherapy for a minimum period of 1 month were included in this study. Oral Health Impact Profile (OHIP-14) is a 14 item pre-validated questionnaire graded on five point Likert scale used to assess Oral Health related Quality of Life based on seven dimensions of impacts of oral conditions on people's OHRQoL. Pearson correlation and Spearman's correlation were used to find out correlation between oral health status and quality of life.
Results of the Study: Among Head and neck cancer group: 45(30.0%) were 35 to 44 years; 44(29.3%) were 45-64 years and 41(27.4%) were 65-74 years age group. Among Head and neck cancer group: 99(66.0%) were males and 51(34.0%) were females. The overall Mean SF-12 scores of head and neck cancer patients was significantly lower as compare to control patients (30.89±4.66 36.14±3.75<0.001). Mean oral health-related quality of life (OHIP-14) was significantly lower in head and cancer group patients as compared to controls (18.35±7.48 vs. 11.14±8.18; <0.001).
Conclusion: It is proved that radiotherapy have a serious influence on oral health of the patients. Considering the influence of radiotherapy on oral health of the patient, assessment of the oral cavity should be done in routine assessment by the dentistry consultant. The OHIP-14 questionnaire has evident to be consistent and valid instrument for assessment of quality of life related to oral health in cancer patients. Among cancer patients this questionnaire should be considered in the protocol of the treatment about complications of oral health and for their optimal well-being.
Keywords: cancer, quality of life, oral-health, head and neck cancer

INTRODUCTION

In the underdeveloped countries cancer is the main cause of mortality and 2nd common cause in the developing world [1]. Cancer of head and neck is at number six with almost of 631,000 diagnosed cases, leading to 350,000 deaths every year [2], in its prevalence the main contribution is cancer oral cavity [3].There is ten times higher chances of head and neck cancer in patients of habitual tobacco users as compared to non-tobacco users [4].

The most common and frequent use of smokeless tobacco in our region further raises its prevalence that's why Pakistan is at second position in this type of cancer [5, 6]. The frequent use of supari, gutka, pan, which have higher content of carcinogenic products like areca nut (with tobacco or without tobacco), slaked lime and betel quid pushing population of our country toward oral cancer [7] with almost 17,770 new cases every year.

In Pakistan, the proportion of lip and oral cavity cancer is higher in patients of head and neck cancer having its higher frequency in males (16% cases) as compare to females [5]. Surgery and radiation therapy systematic treatment or without treatment are the basics treatments for head and neck cancer.

In patients of head and neck cancer treated with radiation therapy, several symptoms are appear with varying course and severity over time [6, 7]. Although techniques of recent radiation therapy have reduced the quantity of radiation to normal tissues as well as reduced burden of symptoms, acute and late symptoms related to treatment are still significant, considerably affecting different features of quality of life [8, 9].

The prevalence of head and neck cancer is increasing in Pakistan according to recent data and in our country very limited data is available related to treatment of head and neck cancer. So we conducted this study in our local population. This research will bridge this gap and results of our study would be helpful in making targeted interventions following need to improve resilience.

MATERIAL AND METHODS

Approval was obtained from the Ethical Review Board. Patients reporting to the Outpatient department of Oncology Holy Family Hospital, Rawalpindi and District Headquarters Hospital, Rawalpindi from Feb 2021 to Sep 2021with the diagnosis of Oral Cancer were included based on the inclusion/exclusion criteria.

Patients aged 18 years and above diagnosed with head and neck cancer undergoing radiotherapy for a minimum period of 1 month; radiation dosage ≥ 30 Gray units with a minimum of 20 sittings, patients with minimum twenty functional teeth were included in this study. Patients having having partial maxilla, partial mandible and restricted mouth opening, patients with chronic systemic diseases that may have influence on oral health were excluded from the study. Sample size of 300 patients was calculated which further included 150 head and neck cancer patients undergoing radiotherapy & 150 age and gender matched healthy subjects (patients' attendees) were enrolled from the hospitals.

Oral Health Impact Profile (OHIP-14) is a pre-validated questionnaire contains14 item classified on Likert scale having five items (0-never, 1-hardly ever, 2-occasionally, 3-fairly often and 4-very often). It is used to evaluate the quality of life related to oral health which further contains seven domains of people's oral condition such as psychological discomfort, physical pain, functional limitation, handicap, social disability, psychological disability and physical disability.

Statistical analysis was done by using (SPSS v-20). Descriptive statistics with frequency, mean and standard deviation were computed. Spearman's correlation and Pearson correlation were used to see the correlation between quality of life and oral health status and $p < 0.05$ considered as significant.

RESULTS

Distribution of study groups according to age is given in Table 1. Among Head and neck cancer group: 45(30.0%) were 35 to 44 years; 44(29.3%) were 45-64 years and 41(27.4%) were 65-74 years age group. Among Head and neck cancer group: 99(66.0%) were males and 51(34.0%) were females as shown in Table 2. Among Head and neck cancer group: none belonged to upper class or lower class; 06(4.0%) were in upper middle class; 124(82.7%) were in lower middle class and 20(13.3%) were in upper lower class. Distribution of the study groups according to oral hygiene practices is presented in Table 3. Regarding location of diagnosis of head and neck cancer (HNC): Location of HNC included: 07(4.6%) labial mucosa; 05(3.4%) buccal mucosa; 54(36.0%) tongue; 21(14.0%) gingiva; 10(6.9%) floor of the mouth; 12(8.0%) soft palate; 05(3.4%) hard palate; 07(4.6%) tonsil; 06(4.0%) paranasal sinuses and nasal cavity; 07(4.6%) salivary glands and 16(10.5%) pharynx. Investigations performed were: 90(60.0%) -biopsy; 23(15.3%) -fine needle aspiration cytology (fnac); 03(2.0%) -ultrasound; 05(3.3%) -computed tomography (ct) and 29(19.4%) -combination of these investigations. HNC were categorized based on Tumor Node Metastasis (TNM) classification: 91(60.7%) T1-4N0M0; 48(32.0%) T1-2N1-3M0 and 11(7.3%) T1-3N 3M0-1. Based on staging of cancer, HNC were categorized: 7(4.7%) Stage I; 57(38.0%) Stage II; 65(43.3%) Stage III and 21(14.0%) Stage IV. Response to short form health survey (sf-12) by study groups is given in Table 5. Domain-wise mean SF-12 scores of study groups is given in Table 6, in 'General health domain', mean SF-12 was significantly lower among Head and neck cancer group (3.04±0.92) as compared to Control group (3.22±.0.81) (p=0.001). In 'Physical functioning domain', mean SF-12 was significantly lower among Head and neck cancer group (5.68±0.64) as compared to Control group (5.94±0.38) (p<0.001). Mean SF-12 in 'Role functioning-Physical domain' was significantly lower among Head and neck cancer group (3.34±0.80) as compared to Control group (3.69±0.49) (p<0.001).

In 'Role functioning -Emotional domain', mean SF-12 was significantly lower among Head and neck cancer group (3.43±0.86) as compared to Control group (3.68±0.68) (p=0.005).

Table 1: Distribution of study groups according to age

Age (years)	Head and neck cancer groupN (%)	Control groupN (%)
18-34	20 (13.3)	33 (22.0)
35-44	45 (30.0)	46 (30.7)
45-64	44 (29.3)	36 (24.0)
65-74	41 (27.4)	35 (23.3)
Total	150 (100)	150 (100)
Mean ± S.D	49.75±13.44	46.57±14.16

Table 2: Distribution of study groups according to gender

Gender	Head and neck cancer groupN (%)	Control groupN (%)
Males	99 (66.0)	105 (70.0)
Females	51 (34.0)	45 (30.0)
Total	150 (100)	150 (100)

Table 3: Distribution of study groups according to socioeconomic status

Socio- economic status	Head and neck cancer groupN (%)	Control groupN (%)
Upper (I)	0 (0)	0 (0)
Upper middle (II)	06 (4.0)	11 (7.3)
Lower middle (III)	124 (82.7)	121 (80.7)
Upper lower (IV)	20 (13.3)	18 (12.0)
Lower (V)	0 (0)	0 (0)
Total	150 (100)	150 (100)

Table 4: Distribution of study groups according to oral hygiene practices

Oral hygiene practices	Options	Head and neck cancer group N=150	Control group N=150
Type of cleaning	Tooth brush	119 (79.3)	126 (84.0)
	Finger	25 (16.7)	16 (10.7)
	Twig	6 (4.0)	8 (5.3)
	Others	0 (0)	0 (0)
Method of cleaning	Vertical	28 (18.6)	33 (22.0)
	Horizontal	82 (54.7)	73 (48.7)
	Circular	40 (26.7)	44 (29.3)
	Combined	0 (0)	0 (0)
Material used	Tooth paste	129 (86.0)	132 (88.0)
	Tooth powder	17 (11.3)	14 (9.3)
	Charcoal	04 (2.7)	04 (2.7)
	Others	0 (0)	0 (0)
Frequency of toothcleaning	Once	103 (68.7)	114 (76.0)
	Twice	47 (31.3)	35 (23.3)
	Thrice	0 (0)	01 (0.7)
Frequency of changing tooth brush		n = 119 (%)	n =126 (%)
Frequency	Less than 3 months	52 (43.7)	55 (43.7)
	3 to 6 months	54 (45.3)	52 (41.2)
	More than 6 months	13 (11.0)	19 (15.1)
Other oral hygieneaids	No aids used	111 (74.0)	117 (78.0)
	Flossing	01 (0.7)	0 (0)
	Interdental aids	01 (0.7)	0 (0)
	Mouth rinse	03 (2.0)	01 (0.7)
	Tongue cleaner	34 (22.6)	32 (21.3)

Table 5: Distribution of Head and Neck cancer subjects according to History ofcancer and its characteristics

History	Options	N =150
Duration of diagnosis	< 6 months	52 (34.7)
	6 months - 1 year	62 (41.3)
	1 year- 2 years	32 (21.3)
	>2 years	04 (2.7)
Location of cancer	Labial mucosa	07 (4.6)
	Buccal mucosa	05 (3.4)
	Tongue	54 (36.0)
	Gingiva	21 (14.0)
	Floor of the mouth	10 (6.9)
	Soft Palate	12 (8.0)
	Hard Palate	05 (3.4)
	Tonsil	07 (4.6)
	Paranasal sinuses and nasal cavity	06 (4.0)
	Salivary glands	07 (4.6)
	Pharynx	16 (10.5)
	Larynx	0(0)
Clinical description (n=127)	Ulcer	118 (92.9)
	Swelling	9 (7.1)
Investigations	Biopsy	90 (60.0)
	FNAC	23(15.3)
	Ultrasound	03 (2.0)
	CT	05(3.3)
	Combination	29 (19.4)
Type of cancer	Squamous cell carcinoma	141 (94.0)
	Adenocarcinoma	07 (4.7)
	Lymphoma	02 (1.3)
TNM classification	$T_{1-4}N_0M_0$	91 (60.7)
	$T_{1-2}N_{1-3}M_0$	48 (32.0)
	$T_{1-3}N_3M_{0-1}$	11 (7.3)
Stage of cancer	Stage I	7 (4.7)
	Stage II	57 (38.0)
	Stage III	65 (43.3)
	Stage IV	21 (14.0)

Table 6: Mean SF-12 scores of study groups

Domains	Head and neck cancergroup	Control group	p value
Functional limitation	4.45±1.54	3.08±1.98	<0.001
Physical pain	4.28±1.96	2.22±1.72	<0.001
Psychological discomfort	2.10±1.82	1.51±1.49	0.002
Physical disability	2.45±1.85	1.52±1.45	<0.001
Psychological disability	1.44±1.42	0.71±0.35	<0.001
Social disability	1.88±1.68	1.10±0.41	<0.001
Handicap	1.73±1.52	0.97±.0.78	<0.001
Mean±S.D	18.35±7.48	11.14±8.18	<0.001

Table7: Mean oral health-related quality of life (OHIP-14 and OIDP) of study groups

Domains	Head and neck cancer group (Mean □ S.D)	Control group(Mean □ S.D)	p value
General health	3.04±0.92	3.22±.0.81	0.001
Physical functioning	5.68±0.64	5.94±0.38	<0.001
Role functioning- Physical	3.34±0.80	3.69±0.49	<0.001
Role functioning - Emotional	3.43±0.86	3.68±0.68	0.005
Bodily pain	3.44±1.14	4.65±0.70	<0.001
Mental health	5.62±1.66	7.36±1.42	<0.001
Vitality	2.72±0.99	3.67±0.72	<0.001
Social functioning	3.63±0.80	3.91±0.73	0.01
Mean □ S.D	30.89□4.66	36.14□3.75	<0.001

DISCUSSION

Cancer is not only a disease, it's a group having hundred diseases in which a cell's group come to be abnormal, uncontrolled division started and assault the tissues. The option of therapy is linked with location, stage of the cancer as well as grade of the tumor and status of the health.[10] Cancer prevalence also varies between the genders. Males have higher prevalence of cancer. The prevalence of males is higher as compared to females the reason is very clear as males are habitual of tobacco chewing and smoking, and due to their increased accessibility and awareness to services about health care.[11,12]

Radiotherapy can lead to significant post-operative morbidity and has detrimental impacts on health associated quality of life. Most of study participants did not have any limitations while climbing several flights of stairs. Whereas in a study a higher proportion of study participants had limitations while climbing several flights of stairs.[13,14] Majority of study participants did not accomplish less due to physical health. This finding is in accordance with one study. Majority of study participants were able to do work or other activities as carefully as usual. A higher proportion of study participants in Head and neck cancer group experienced pain that interfered with their normal work during the past 4 weeks when compared to Control group. This finding is in line with one study.[14]

Study participants in Head and neck cancer group had significant worse scores across all 7 domains as compared to control group. Most affected domain was Functional limitation which indicates that head and neck cancer subjects had difficulty with speech and experienced gustatory impairment. This finding was similar to other studies.[15,16,17] Overall, mean OHIP-14 was significantly higher among Head and neck cancer group (18.35±7.48) as compared to Control group (11.14±8.18) which shows that oral health related quality of life was poor among head and neck cancer subjects. A study reported similar mean score in Head and neck cancer subjects (21.4 ± 10.11).[16] Another study that used OHIP reported a mean score in Head and neck cancer subjects (72.08) and Control group (21.06).[18]

Few studies which were conducted after the completion of radiotherapy (RT) reported significantly higher mean scores among Head and neck cancer group as compared to Control group across all the domains and the most affected domains were physical disability, physical pain and functional limitation.[19,20,21]

CONCLUSION

It is proved that radiotherapy have a serious influence on oral health of the patients. Considering the influence of radiotherapy on oral health of the patient, assessment of the oral cavity should be done in routine assessment by the dentistry consultant. The OHIP-14 questionnaire has evident to be consistent and valid instrument for assessment of quality of life related to oral health in cancer patients. Among cancer patients this questionnaire should be considered in the protocol of the treatment about complications of oral health and for their optimal well-being.

REFERENCES

1. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer. 2015;136(5):E359–E86.
2. upta B, Johnson NW, Kumar N. Global epidemiology of head and neck cancers: a continuing challenge. Oncology. 2016;91(1):13–23.
3. Mummudi N, Agarwal J, Chatterjee S, Mallick I, Ghosh-Laskar S. Oral cavity cancer in the Indian subcontinent–challenges and opportunities. Clin Oncol. 2019;31(8):520–8.
4. Prabhash K, Babu G, Chaturvedi P, Kuriakose M, Birur P, Anand AK, et al. Indian clinical practice consensus guidelines for the management of squamous cell carcinoma of head and neck. Indian J Cancer 2020;57, Suppl S1:1-5.
5. Siddiqi K, Shah S, Abbas SM, Vidyasagaran A, Jawad M, Dogar O, et al. Global burden of disease due to smokeless tobacco consumption in adults: analysis of data from 113 countries. BMC Med. 2015;13(1):194.
6. Verdonck-De Leeuw IM, Buffart LM, Heymans MW, et al. The course of health-related quality of life in head and neck cancer patients treated with chemoradiation: A prospective cohort study. Radiother Oncol 2014;110:422–428.
7. Hawkins PG, Kadam AS, Jackson WC, Eisbruch A. Organ-sparing in radiotherapy for head-and-neck cancer: Improving quality of life. Semin Radiat Oncol 2018;28:46–52.
8. Hunter KU, Schipper M, Feng FY, et al. Toxicities affecting quality of life after chemo-IMRT of oropharyngeal cancer: Prospective study of patient-reported, observer-rated, and objective outcomes. Int J Radiat Oncol Biol Phys 2013;85:935–940.
9. Lacas B, Bourhis J, Overgaard J, et al. Role of radiotherapy fraction- ation in head and neck cancers (MARCH): An updated meta-analysis. Lancet Oncol 2017;18:1221–1237.
10. Hayter C. Cancer: The worst scourge of civilized mankind. Can Bull Med Hist. 2003;20(2):251-64.
11. Joshi P, Dutta S, Chaturvedi P, Nair S. Head and neck cancers in developing countries. Rambam Maimonides Med J. 2014;5(2):1-6.
12. Bhattacharjee A, Chakraborty A, Purkaystha P. Prevalence of head and neck cancers in the North East- an institutional study. Indian J Otolaryngol Head Neck Surg. 2006;58(1):15-9.
13. Interpreting the SF-12. Utah Health Status Survey, Utah Department of Health. Available at: https://www.health.utah.gov(Accessed on:12/08/2011).
14. Klantari M, Marjani H, Torabi M. Assessment of health related quality of life (SF-12) in patients with head and neck cancer (a cross-sectional study). Sch J Dent Sci. 2017;4(5):250-3.
15. Torabi M, Larizadeh MH, Safizadeh H, Afshar MK, Ahmadi NM. Quality of life and OHRQoL in head and neck cancer

patients in Kerman, Iran. J Oral Health Oral Epidemiol 2012;1(2):78-82.

16. Bhalla A, Anup N, Bhalla AP, Singh SB, Gupta P, Bhalla S. Oral health related quality of life (OHRQoL) amongst head and neck cancer patients undergoing chemotherapy and radiotherapy at Sawi Mansingh hospital, Jaipur, India. Sch Acad J Biosci.2015;3(1A):3-12.

17. Maghsudlu S, Nafarzadeh S, Moslemi D, Foroghi R, Sistani MM. Oral health related quality of life in patients with head and neck tumors undergoing chemo and radiotherapy. J Cranio Maxill Res. 2016;3(2):196-201.

18. Barrios R, Tsakos G, Gil-Montoya JA, Montero J, Bravo M. Association between general and oral health-related quality of life in patients treated for oral cancer. Med Oral Patol Oral Cir Bucal. 2015;20(6):678-84.

19. Barrios R, Bravo M, Gil-Montoya JA, Martínez-Lara I, García-Medina B, Tsakos G. Oral and general health-related quality of life in patients treated for oral cancer compared to control group. Health Qual Life Outcomes. 2015;13(1):9-17.

20. Verma V, Simone CB, Mishra MV. Quality of life and patient-reported outcomes following proton radiation therapy: a systematic review. J Natl Cancer Inst. 2017;110(4):341-53.

21. Bertl K, Loidl S, Kotowski U, Heiduschka G, Thurnher D, Stavropoulos A et al. Oral health status and dental care behaviours of head and neck cancer patients: a crosssectional study in an Austrian tertiary hospital. Clin Oral Investig. 2016;20(6):1317-27.