

Original Article

Oral health-related quality of life in patients with oral squamous cell carcinoma: A case-control study

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ABSTRACT

Background: The prevalence of oral squamous cell carcinoma (OSCC) has increased in recent years. With the development of various treatments, the mortality rate has decreased and more people are living with the consequences of the disease and its treatment, which can have a great impact on the quality of life. Some questionnaires measure the impact of the disease on daily activities and patient behavior. In this study, the oral health-related quality of life (OHRQOL) was assessed through the Oral Health Impact Profile (OHIP)-14 questionnaire between the OSCC patient and control groups.

Materials and Methods: In this cross-sectional study, the OHIP-14 questionnaire was given to 51 OSCC patients who had completed the treatment at least 6 months before participating in this study and 51 healthy individuals, and we used the Chi-square test, independent sample *t*-test, one-way ANOVA, and linear regression in three models. $P = 0.05$ was considered statistically significant.

Results: The mean age of patients was 55.86 ± 15.04 years and the control group was 54.96 ± 14.08 years. Women made up 51% of patients. The mean OHIP score was 22.84 ± 11.42 in the patient group and 17.92 ± 9.23 in the control group, which indicates a significant ($P = 0.005$) difference between the two groups according to the independent sample *t*-test.

Conclusion: The OHRQOL of patients has significantly decreased compared to the control group. Surgery had the lowest quality reduction, and combined surgical treatment with radiotherapy and chemotherapy had the highest reduction in the OHRQOL. It is recommended to have regular follow-up sessions and to have a proper diet during and after treatment.

Key Words: Health-related quality of life, mouth neoplasms, oral squamous cell carcinoma

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INTRODUCTION

In recent years, the prevalence of oral malignancies has increased. Among head-and-neck cancers, oral cancer is the eighth most common type of cancer in the world. Ninety percent of oral cancers are

squamous cell carcinoma.^[1] The most affected areas are the tongue, lower lip, and floor of the mouth.^[2,3] The highest rate of lymph nodes and distant organ invasion has been seen in tumors of the tongue and

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floor of the mouth. It is more common in men and people over 45 years old.^[4] The choice of proper treatment is based on the stage of the disease. Surgery is the fundamental of combination therapies. The oral cavity has many serious functions, including chewing, digestion, and speaking. When choosing a treatment method, different factors should be considered according to the needs of each person to keep up the quality of life of the person as much as he survives.^[5] In oral tumors, the organ that plays an important role in daily activities such as talking and chewing food may be destroyed.^[6] Quality of life assessment has become a valuable tool by which it examines the process of disease recovery and the effectiveness of treatment.^[7] (which has been done in previous studies including Sadri and Bahraminejad.^[8] However, in our study, it was done after 6 months and between different treatment methods). The main reason for the quality of life assessment is that in the future for choosing between two treatments, a method that in the past had the least complications and the least reduction in the quality of life of patients is the better choice.^[9] This study was performed to evaluate the quality of life of patients with oral squamous cell carcinoma (OSCC), 6 months posttreatment compared with the control group.

MATERIALS AND METHODS

This cross-sectional descriptive study, 51 OSCC patients referred to the Cancer Institute of Imam Khomeini Hospital Complex in Tehran were studied. The examined samples were people over 18 years of age who had passed at least 6 months post treatment. Furthermore, 51 people in the control group included general patients (that adjusted age and sex) referred to Yaftabad Hospital in Tehran. They were older than 18 years without gender significance. Questionnaire questions were read for illiterate ones and people who could not answer for any reason. The questionnaire in this study was prepared consciously and voluntarily after justifying and completing the consent form. This study has been approved by the Ethics Committee of Alborz University of Medical Sciences with the ethics code IR.ABZUMS.REC.1398.178.

The demographic questions and a Persian version of the Oral Health Impact Profile (OHIP)-14 questionnaire^[10] were provided to individuals. Demographic information included age, sex, and underlying diseases. Furthermore, according to the

patients' records, information such as the location of the involvement (such as maxillary, mandible, buccal mucosa, tongue, and the floor of the mouth), therapeutic methods performed (surgery, radiation therapy, chemotherapy, and combination therapies), and the date of completion of treatment, which should have been at least 6 months after finishing of the treatment, were taken. OHRQoL was evaluated through the Persian version of the valid questionnaire OHIP-14, which was confirmed in terms of validity and reliability.^[11] This questionnaire consists of 14 questions that analyze seven aspects of quality of life containing functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. We used the 5-point Likert scale (Score 0 means never, 1 rarely, 2 occasionally, 3 often, and 4 always).^[12] And finally, we used the ADD (additive) method for the total score of the questionnaire. A higher score shows a lower oral health-related quality of life (OHRQOL). We entered the data and analyzed it in SPSS software version 23 (International Business Machines Corporation, New York, USA). The normal distribution of quantitative data was investigated by the Kolmogorov–Smirnov test. We used the Chi-square test to compare the percentage of qualitatively dependent variables among the groups, independent sample *t*-test to compare OHIP score for variables in two groups, and one-way ANOVA for variables in more than two groups. Finally, we used linear regression in three models to evaluate the mean OHIP score. A statistically significant level of 0.05 was considered.

RESULTS

Demographic findings

The samples included 51 patients with a mean age of 55.86 ± 15.04 years (range: 32–89 years and median age: 55 years) and 51 healthy control people with an average age of 54.96 ± 14.08 years (range: 30–88 years and median age: 53 years). Fifty-one percent of patients were women, and the number of men and women in the patient and control groups was equal. The Chi-square test showed no significant difference between men and women in terms of disease ($P = 1.00$). Furthermore, 43.1% of patients were under 50 years old, and there was no significant difference between the case and control groups in terms of the age of participants ($P = 0.755$). Table 1 shows the demographic data.

Table 1: Demographic and clinical data variable description of patients and controls

Variable	Patients, n (%)	Controls, n (%)	P
All	51 (100)	51 (100)	
Sex			
Men	25 (49)	25 (49)	1.000 ^a
Women	26 (51)	26 (51)	
Age (years)			
<50	22 (43.1)	20 (39.2)	0.755 ^b
50-69	18 (35.3)	21 (41.2)	
>70	11 (21.6)	10 (19.6)	
Range	32-89	30-88	
Mean±SD	55.86±15.04	54.96±14.08	
Dentist visit			
Regular	14 (27.5)	15 (29.4)	0.826 ^a
Tumor site			
Tongue	30 (58.8)		
Mandible	5 (9.8)		
Buccal mucosa	5 (9.8)		
Mouth floor	4 (7.8)		
Lip	4 (7.8)		
Locoregional metastasis	3 (5.9)		
Treatment			
Surgery	4 (7.8)		
Surgery+RT	29 (56.9)		
Surgery+RT+CH	17 (33.3)		
RT+CH	1 (2.0)		

^aChi-square test, ^bIndependent sample t-test. RT: Radiotherapy, CH: Chemotherapy, SD: Standard deviation

Oral Health Impact Profile

The average OHIP score in patients was 22.84 ± 11.42 (range: 6–50) and the control group was 17.92 ± 9.23 (range: 1–37). The scores for various aspects of OHRQOL are given in Table 2.

The mean OHIP score based on tumor site in the tongue was 23.23 ± 10.71 (range: 6–49), buccal mucosa was 22.20 ± 7.36 (range: 12–32), the floor of the mouth was 23.75 ± 11.44 (range: 10–38), the mandible was 31.60 ± 15.73 (range: 9–50), the lip was 16.00 ± 14.99 (range: 6–38), and locoregional metastases was 30.33 ± 10.70 (range: 21–42). The within-group significance level was 0.385 according to Table 3.

OHIP average based on different types of treatment was obtained. The score of surgery was 9.00 ± 3.16 (range: 6–13), surgery with radiotherapy was 23.86 ± 10.65 (range: 6–44), all treatments together (surgery–radiotherapy–chemotherapy) was 27.65 ± 11.61 (range: 12–50), and radiotherapy combined with chemotherapy was 18. The within-group significance level was 0.025. Table 3 shows the mean score of OHIP.

DISCUSSION

The mean score of OHIP-14 in patients was significantly higher than the control group. Furthermore, in all seven aspects, patients scored higher than the control group, but in the aspects of functional limitation and physical pain, this difference was significant. The biggest problem of the patients was psychological discomfort that it is possible to solve by taking care of these people after the end of treatment because these people are mentally fragile, and if ignored, it can have irreversible consequences. In the Barrios study, which is consistent with our study in terms of the time elapsed since the end of treatment, patients' scores were significantly higher than the control group in all aspects and a whole.^[13] In the David Kam *et al.*'s study, the total score and the score of functional limitation were significantly higher in the patient group than the healthy ones after the end of treatment.^[14] Among treatments, surgery has the least negative impact on the quality of life, whereas combined therapy (surgery with radiotherapy and chemotherapy) has the most negative impact on the quality of life. This could be due to dry mouth side effects caused by these treatments compared to surgery. This result is in line with the results of earlier studies.^[8,13,15]

In the present study, 43.1% of patients were under 50 years of age. In the study of Sadri and Bahraminejad, the mean age of patients is consistent with the mean age of participants in this study.^[8] Whereas in the Barrios study, 12.7% of patients were under 50 years of age.^[13] According to previous studies, age over 45 years is considered one of the risk factors for oral cancer.^[16] Due to the results of the present study, the possibility of reducing the age of oral cancer can be considered, which can be due to lifestyle change. In some countries, many cases have been reported before the age of 40 years. Increased incidence of oral cancer in young adults was first reported in Scotland and Denmark and now appears to be common in many countries.^[17]

In terms of relationship between gender and mean OHIP-14 between males and females, the total score was higher in women than men, which was not significant ($P = 0.620$). The higher score of women can be attributed to their different physical conditions or hormonal factors. Men scored higher on functional limitations, social problems, and disabilities than women, but this difference was not significantly

Table 2: Comparison of oral health-related quality of life (Oral Health Impact Profile-14) between patients and controls

OHIP-14	Mean±SD		P ^b
	Patients	Controls	
Functional limitation	3.06±2.24	1.43±1.36	0.000
Physical pain	3.84±2.49	2.71±1.73	0.009
Psychological discomfort	5.00±1.86	4.41±1.39	0.074
Physical disability	3.33±2.83	2.61±1.94	0.134
Psychological disability	3.55±2.52	2.80±2.35	0.126
Social disability	3.14±2.72	2.73±2.06	0.340
Handicap	1.92±2.21	1.24±1.30	0.060
Total	22.84±11.42	17.92±9.23	0.005

^bIndependent sample t-test. OHIP-14: Oral Health Impact Profile, SD: Standard deviation

Table 3: Comparison of oral health-related quality of life (Oral Health Impact Profile-14) between clinical variables

Variable	OHIP-14 (mean±SD)	P ^a
Tumor site		
Tongue	23.23±10.71	0.385
Mandible	31.60±15.73	
Buccal mucosa	22.20±7.36	
Mouth floor	23.75±11.44	
Lip	16.00±14.99	
Locoregional metastasis	30.33±10.70	
Treatment		
Surgery	9.00±3.16	0.025
Surgery + RT	23.86±10.65	
Surgery + RT + CH	27.65±11.61	
RT + CH	18	

^aOne-way ANOVA test. OHIP-14: Oral Health Impact Profile, SD: Standard deviation, RT: Radiotherapy, CH: Chemotherapy

interpreted, which is approved by the study of Torabi *et al.* in Kerman.^[18] However, the results of Tahani study were different from the present study, which was not significant.^[19]

The percentage of patients who had regular annual visits to the dentist before diagnosis was only 27.5%, so 72.5% of them did not have regular visits at least once a year. These results were almost similar in the control group. The American Cancer Society advises dentists to consider soft tissue examinations during a routine oral checkup to assess the presence of malignant lesions.^[20] Perhaps, if patients had a regular visit to the dentist at least once a year, they would have a faster diagnosis.

According to the results of the present study, the most common lesion sites were tongue, lower jaw and buccal mucosa. The patient population was not large enough to perform accurate statistical tests, and we

were only able to report the frequency of the lesion, which requires a higher population, according to the Barrios study.^[13]

In most aspects and in general, the mandible had the highest, and the lip had the lowest OHIP score, which confirms the results of Rao.^[21] The reason for the high score of the mandible can be attributed to the effect of surgery performed, followed by facial asymmetry, loss of teeth, and loss of tongue support by the mandible.^[21] Reconstruction of the defect after mandibular resection is also one of the most challenging procedures for specialists.^[22] According to the results of Kübler, after treatment, there has been no restriction on mouth opening and lip function in earlier studies, which improve a person's quality of life.^[23]

In terms of functional limitations, the floor of the mouth lesion was in the worst condition, the reasons of which include the complexity of the surgical access site (enclosed by the lower jaw and tongue), operative complications, and then functional complications.^[24] In terms of physical and mental disability, locoregional metastases led to a significant reduction in the quality of life. The proximity of the lesion to a lymph node causes malignant cells to metastasize and invade distant areas or in the origin (locoregional metastasis). Hence, if the surgeon has difficulty accessing the primary lesion, there is a need for further treatments such as radiotherapy and chemotherapy,^[25] which can reduce the quality of life in the physical and mental field. Due to time constraints and the small number of patients referred for periodic examinations, we had to admit people with regional metastases to obtain a sufficient number of samples. Given that we know that these people are in a worse condition than people with primary lesion, it is better to exclude these people in future studies.

CONCLUSION

The present study shows that the OHRQOL of patients has significantly decreased compared to the control group. Furthermore, in all aspects of OHIP, patients scored higher than the control group, but this difference is only significant in functional limitation and physical pain. Among the existing treatments, surgery had the lowest and combination therapy had the highest reduction in quality of life, and it can be concluded that the side effects of radiotherapy

and chemotherapy decrease the quality of life greatly. Doing radiotherapy more conservatively, having regular follow-up sessions with an oral disease specialist during and after treatment, giving appropriate medications to relieve complications after treatment, having a proper diet, and spiritual care can help these people a lot.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Alborz University of Medical Sciences (Date 2019.12.15/No. IR.ABZUMS.REC.1398.178).

Consent to participate

Informed consent was obtained from all individual participants included in the study.

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Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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