



Oral Squamous Cell Carcinoma in Elderly vs Young Patients: A Comparative Analysis using STNMP Staging System

¹R Syed mukith, ²BR Ahmedmujib, ³TS Bastian

ABSTRACT

Background: Oral squamous cell carcinoma (OSCC) is the foremost type of oral cancer usually seen in elderly patients. The intention of this study is to correlate clinicopathological features and recurrence of OSCC between patients who are above 40 years of age with that of patients below 40 years of age using site, tumor, node, metastasis and pathology (STNMP) system.

Materials and methods: This study was conducted on 75 patients who reported with OSCC and underwent treatment. A total of 50 patients above 40 years of age (group I) and 25 patients below 40 years of age (group II) were included. Clinicopathologic data, treatment, and follow-up for 5 years were obtained from archives of concerned departments. The relevant details required for STNMP grading of patients and recurrence within a period of 5 years was recorded. Chi-square test was used for statistical analysis.

Results: Out of all the patients reported with OSCC in 8 years, 22.14% were below 40 years of which 64% were males. Among younger patients, overall STNMP stages were in higher stages when compared with elder patients. Comparison of percentage of uncontrolled cases between groups did not show any significant difference; also this study showed higher the stage at diagnosis more the recurrence after treatment in both groups.

Interpretation and conclusion: OSCC is in alarming raise among young patients, showing higher stages clinicopathologically at presentation. However, these higher stages at diagnosis did not affecting the treatment outcome when compared to elder patients hence, advanced studies on OSCC affecting younger patients are very crucial.

Keywords: Oral cancer, Oral squamous cell carcinoma, Young patients, STNMP staging, Five years recurrence rate.

How to cite this article: Syed mukith R, Ahmedmujib BR, Bastian TS. Oral Squamous Cell Carcinoma in Elderly vs Young Patients: A Comparative Analysis using STNMP Staging System. *Oral Maxillofac Pathol J* 2014;5(2):471-475.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Oral cancer is sixth most common cause of cancer related deaths globally, its relative position varies with age and sex.¹ In the Indian subcontinent, it is one of the common form of cancer reported with high frequency.^{2,3} Histologically, over 95% of oral cancers are squamous cell carcinomas.^{1,2,4}

Oral squamous cell carcinoma (OSCC) is generally considered as more common in men between 6th and 8th decades of life⁵ and only about 0.4 to 3.9% of patients are younger than 40 years of age.⁶ Literature shows biased data regarding the aggression and prognosis of OSCC in young patients, general view is that it is more aggressive and have worse prognosis.⁷⁻¹⁰ There are various studies contradicting this view.¹¹⁻¹⁶

Vast number of studies on potential prognostic factors have been published, none of them have gained strong clinical acceptance; hence, most of the institutions follow TNM system alone despite its limitations.¹⁷ A special staging system to upgrade prognosis analyzing factors was introduced adding site and pathology to TNM system with scores for each parameter known as site, tumor, node, metastasis and pathology (STNMP) system.^{18,19} The objectives of this study is to evaluate and compare grades and stages of OSCC in patients above 40 years of age (>40 years) with that of patients below or at 40 years of age (≤40 years), according to STNMP system along with comparison of recurrence in 5 years.

MATERIALS AND METHODS

This is a retrospective study in which the records of patients reported with primary OSCC from 1997 to 2005 were retrieved from the archives of diagnosis department from a dental institution. Five years follow-up of patients after treatment is done to determine the outcome (through records for those reported with recurrence before 2005 and directly for those who reported with recurrence later than 2005). The study group consisted of patients whose complete case records providing relevant clinical details for study were

¹Assistant Professor, ^{2,3}Professor and Head

¹Division of Oral Pathology and Biology, Department of Basic Clinical Dental Sciences, IBN Sina National College for Medical Studies, Al-Mahjar, Jeddah, Saudi Arabia

²Department of Oral Pathology and Microbiology, Bapuji Dental College and Hospital, Davangere, Karnataka, India

³Department of Oral Pathology, Mahe Institute of Dental Sciences, Mahe, Puducherry, India

Corresponding Author: R Syed mukith, Assistant Professor Division of Oral Pathology and Biology, Department of Basic Clinical Dental Sciences, IBN Sina National College for Medical Studies, Al-Mahjar, Jeddah-21418, Saudi Arabia, Phone: 00966-501840058, e-mail: ibnsinatrimple@gmail.com

available along with archival formalin-fixed and paraffin-embedded specimens. Those patients who had systemic diseases or who refused treatment or discontinued treatment and those who reported with primary OSCC after beginning of study were excluded from the study, since outcome of treatment was looked for 5 years period.

A total of 75 patients were randomly selected for the study and categorized as group I: 50 cases >40 years and group II: 25 cases ≤40 years. More number of patients in group I was used to increase the statistical power of elder patients for comparison with younger patients. All the relevant clinical and histopathological data was procured in a preset performa using the case records; however, histological grading was reconfirmed in Oral Pathology Department using archival formalin-fixed paraffin-embedded tissue specimens by sectioning, H & E staining and observation under compound microscope.

The subject's OSCC grading and staging was done according to STNMP system as detailed by Langdon and Henk.^{18,19} As a measure of outcome, tumors were clustered as controlled and uncontrolled. Controlled tumors are those in which there had been no recurrence in 5 years of treatment and uncontrolled tumors were those which showed development of local recurrence or cervical lymph node metastasis or distant metastasis in a period of 5 years of treatment. Finally, obtained results were tabulated and comparison between the group I (>40 years) and group II (≤40 years) was done. Statistically analysis was done with chi-square test.

RESULTS

The distribution of OSCC patients in our institution from 1997 to 2005 according to age showed that the number of patients concentrated more in 4th to 7th decade of life, of which 22.14% of cases were ≤40 years of age. Overall male: female ratio among the patients included in the study was 1:1.2 (34 males + 41 females), in group I (>40 years) ratio was 1:1.8 (18 males + 32 females) and in group II (≤40 years) 1 : 0.6 (16 males + 9 females).

Site-wise comparison of OSCC did not show statistically significant difference between the groups as shown in Table 1, in both the groups commonly involved sites are cheek, followed by gingiva and tongue.

Tumor size, node involvement, and pathology grades are shown in Table 2, none of them showed significant difference. Metastasis grades are not included since none of the case in any of the group was reported with metastatic disease. Tumor grades comparison shows T2 and T3 are most commonly reported in both the groups, node involvement showed N1 and N2 are commonly noted in both the groups and pathology comparison showed moderately-differentiated squamous cell carcinoma (MDSCC) followed by well-differentiated squamous cell carcinoma (WDSCC) in both the groups.

Using the total scores of STNMP parameters cases were categorized into one of the 4 stages. Comparison of these stages between the two groups is shown in Table 3, which illustrate statistically significant difference between groups. Group I patients were more in stage II; but in contrast, group II were distributed in all the stages and concentrated more in stage III.

Comparison of number of uncontrolled tumors in both the groups and distribution of number and percentage of recurrence cases from that of primary OSCC STNMP stages is shown in Table 4. Both the groups show that the number of uncontrolled cases are more among patients who were treated for higher STNMP stages.

DISCUSSION

In India, cancer of oral cavity is one of the five leading sites of cancer in either sex.³ More than 95% of oral cancers are OSCCs.^{1,2,4} The number of patients affected from OSCC <40 years of age are relatively low and increases with age in all parts of world.²⁰ In western countries, 98% of OSCC patients are >40 years of age; however, in past 2 to 3 decades there is alarming rise in incidence among younger men.²¹ In our

Table 1: Distribution of study subjects according to site of involvement of OSCC

Site	Group I	Percentage	Group II	Percentage	Total
Lip skin	1	2	0	0	1
Lip mucosa	1	2	1	4	2
Tongue	6	12	6	24	12
Cheek	21	42	8	32	29
Palate	5	10	1	4	6
Floor of mouth	1	2	0	0	1
Gingiva/Alveolus	15	30	8	32	23
Maxillary sinus	0	0	1	4	1
Central Ca of Jaw	0	0	0	0	0
Total	50	100	25	100	75

Chi-square: 5.9530; df: 7; p: 0.5452 (NS)

Table 2: Distribution of study subjects according to tumor size, lymph node involvement and pathology in groups I and II

<i>Tumor</i>					
	<i>Group I</i>	<i>Percentage</i>	<i>Group II</i>	<i>Percentage</i>	<i>Total</i>
T1	7	14	4	16	11
T2	21	42	15	60	36
T3	18	36	4	16	22
T4	4	8	2	8	6
Total	50	100	25	100	75
Chi-square: 3.4430; df: 3; p: 0.3282 (NS)					
<i>Node</i>					
N0	11	22	3	12	14
N1	23	46	12	48	35
N2	10	20	5	20	15
N3	5	10	2	8	7
N4	1	2	3	12	4
Total	50	100	25	100	75
Chi-square: 4.1040; df: 4; p: 0.3921 (NS)					
<i>Pathology</i>					
WDSCC	16	32	9	36	25
MDSCC	21	42	10	40	31
PDSCC	13	26	6	24	19
Total	50	100	25	100	75
Chi-square: 0.6060; df: 2; p: 0.8949 (NS)					

Table 3: Distribution of study subjects according to STNMP stages

<i>Stage</i>	<i>Group I</i>	<i>Percentage</i>	<i>Group II</i>	<i>Percentage</i>	<i>Total</i>
I	0	0	3	12	3
II	28	56	8	32	36
III	15	30	9	36	24
IV	7	14	5	20	12
Total	50	100	25	100	75
Chi-square: 8.5630; df: 3; p: 0.0357 (S)					

country which is considered as high prevalence area of the world many of the patients affected from OSCC are below 35 years of age, probably due to increased use of tobacco.²¹ Similar trend is noted in this study more number of patients were concentrated in 4th to 7th decade of life, out of the reported cases in our institute 22.14% OSCC cases were below 40 years of age. These results were similar to reports from various institutions in India, where 16 to 28% of oral cancers were seen among young individuals <40 years of age.²¹

Among patients >40 years of age male female ratio was 1:1.8 and ≤ 40 years of age 1: 0.6, i.e. among younger patients males are three times more commonly affected by OSCC compare to elder patients. Few studies have shown younger females predominantly affected from OSCC¹⁰ but majority of studies show higher number of males affected from OSCC in younger age.¹¹ A study in India on OSCC patients below 35 years of age has shown ratio of 1: 0.43²² these results were similar to the present study which is probably due to habitual consumption of tobacco and alcohol in younger males in our country.

Site-wise analysis of the study subjects, irrespective of age, illustrated that around two third of patients are affected by OSCCs of gingiva and cheek. A study noted that the oral cancers in India are due to the use of smokeless tobacco and are site specific.³ Probably in both the groups of our patients the cancers of cheek and gingiva are due to the habit of quid placement in the gingivobuccal sulcus. Site-wise comparison show higher tongue OSCCs in younger group compare to elder group. Globally, most of the reports suggest that tongue is most commonly affected intraoral site of OSCC especially in younger individuals.²¹

Almost half of the cases, irrespective of age groups in the study, were reported with T2 grade, when the study subjects were compared for tumor size between elder and younger age groups T2 and T3 graded patients were more in elder group, conversely T2 and T1 graded patients were more in younger group. A similar study on OSCC showed number of cases with T1 grade more among younger patients even though the common grade irrespective of age groups was T2.⁵ These findings suggests younger patients affected from OSCC report earlier than elder patients.

Table 4: Distribution of number and percentage of uncontrolled tumors, out of primary OSCC stages

	<i>Uncontrolled OSCC in group I</i>	<i>Percentage group I</i>	<i>Uncontrolled OSCC in group II</i>	<i>Percentage group II</i>
Stage I	0 of 0	0	0 of 3	0
Stage II	5 of 28	17.85	1 of 8	12.50
Stage III	4 of 15	26.66	3 of 9	33.33
Stage IV	3 of 7	42.85	1 of 5	20
Total	12 of 50	24	5 of 25	20

Chi-square: 1.12; df: 2; p: 0.572 (NS)

When the lymph node status was evaluated, nearly half of the total cases in the study, irrespective of age, reported with N1 grade. Comparison between younger and elder groups showed slightly higher grades of nodes in former. Similar findings has also been noted in a study performed on 2305 patients affected by upper aerodigestive tract SCCs.²³ This suggests that even though elder patients show higher grades of tumor size the nodal involvement is comparatively lower at presentation, on contrary younger patients show lower grades of tumor size with higher grades of nodal involvement at presentation.

With regard to pathological features, irrespective of groups, in this study, most of the patients reported with MDSCC. Comparison between the groups did not show any statistical difference. Few studies suggest WDSCC is more commonly seen in younger patients^{5,22} and MDSCC in elder patients.⁵

STNMP stage-wise comparison showed statistically significant difference between the elder and younger groups with more percentage of cases reported with OSCC in former were in stage II; whereas, later group showed distribution of cases in all stages but concentrated in stage III. Although, dental literature has sufficient data on TNM staging, but comparison of OSCC between age groups and STNMP staging are few. A study which evaluated OSCC according to TNM system, showed 66.3% of patients in younger age with higher stages (stage III and IV) at presentation.²² These results were in proximity to our findings of 56% (stage III and IV). In contrast, one similar study demonstrated 68.6% of patients ≤ 40 years of age in lower stages (stage I and II) of OSCC.⁵ These differences may be due to geographic location since former is done on Indian patients and later is conducted in Eastman dental institute, London.

Uncontrolled tumor assessment of study subjects showed 22.66% of cases reporting back in 5 years period with recurrence irrespective of age. With respect to recurrence rate, variation was insignificant between the younger and elder patients. A study has reported recurrence of 54% cases in a period of 5 years and difference was noted between younger and elder age groups.²⁴ One more study reported about 45% of OSCC patients in 3 years period showing recurrence with

both younger as well as elder age groups showing same percentage of recurrences.²⁵ A study in India on patients below 35 years of age has reported 34% of recurrences in a period of 3 years followed by 42.7% recurrence in 5 years.²² One more study on disease free survival rates in patients >40 with ≤ 40 years have not come across any difference.²⁶

In the present study, elder group showed recurrence in the well-accepted pattern of higher the stage at diagnosis more common the recurrence after treatment. In younger group although variation was noted it was statistically insignificant, i.e. recurrence were common in stage III—33.33% followed by stage IV—20.00% and stage II—12.50%, this mild deviation is probably due to very less number of uncontrolled tumors in younger group.

The recurrence values obtained in our study are very small as compared to above mentioned studies and are most likely far from ideal, this is due to difficulty in follow-up of the treated cases since very few patients who show recurrence report back to hospital where primary treatment is done, also information of those who die after discharge from hospitals are rarely reported.

CONCLUSION

There is an increasing trend of OSCC involving younger males with higher STNMP stage at presentation which does not affect disease free survival rate when compared to elder patients. These findings suggest that OSCC spreads rapidly among younger patients but resists well if treated. Hence, further studies on genetics, immune system, diet, habits, and demographics are necessary to unveil the difference between younger and elder patients.

ACKNOWLEDGMENTS

1. Dr Keerthi Kumar Rai, Professor and Head, Department of Oral and Maxillofacial Surgery, Bapuji Dental College and Hospital, Davangere.
2. Dr Ashok L, Professor and Head, Department of Oral Medicine and Radiology, Bapuji Dental College and Hospital, Davangere.

3. Dr Javali, Chief Biostatistician, SDM Dental College, Dharwad, Karnataka.

REFERENCES

1. Shah JP, Johnson NW, Batsakis JG, editors. Oral cancer. London: Martin Dunitz; 2003.
2. Moore SR, Johnson NW, Pierce AM, Wilson DF. The epidemiology of mouth cancer: a review of global incidence. *Oral Dis* 2000 Mar;6(2):65-74.
3. Gupta PC, Nandakumar A. Guest editorial: oral cancer scene in India. *Oral Dis* 1999;5:1-2.
4. Shah JP, Zelefsky MJ. Cancer of the oral cavity. In: Harrison LB, Sessions RB, Hong WK, editors. *Head and neck cancer: a multi disciplinary approach*. 2nd ed. Philadelphia: Lippin Williams and Wilkins 2004. 266-305 p.
5. Sasaki T, Moles DR, Imai Y, Speight PM. Clinicopathological features of squamous cell carcinoma of the oral cavity in patients < 40 years of age. *J Oral Pathol Med* 2005;34(3):129-133.
6. Cusumano RJ, Persky MS. Squamous cell carcinoma of the oral cavity and oropharynx in young adults. *Head Neck Surg* 1988; 10(4):229-234.
7. Vargas H, Pitman KT, Johnson JT, Galati LT. More aggressive behavior of squamous cell carcinoma of the anterior tongue in young women. *Laryngoscope* 2000;110(10):1623-1626.
8. Sarkaria JN, Harari PM. Oral tongue cancer in young adults less than 40 years of age: rationale for aggressive therapy. *Head Neck* 1994;16(2):107-111.
9. Kuriakose M, Sankaranarayan M, Nair MK, Cherian T, Sugar AW, Scully C, Prime SS. Comparison of oral squamous cell carcinoma in younger and older patients in India. *Eur J Cancer B Oral Oncol* 1992;28B(2):113-120.
10. Byers RM. Squamous cell carcinoma of the oral tongue in patients less than thirty years of age. *Am J Surg* 1975;130(4):475-478.
11. Schantz SP, Yu GP. Head and neck cancer incidence trends in young Americans 1973-1997 with a special analysis for tongue cancer. *Arch Otolaryngol Head Neck Surg* 2002;128(3):268-270.
12. Yamazaki H, Inoue T, Koizumi M, Yoshida K, Kagawa K, Shimomi H, Imai A, Tanaka E, Teshima T, Nakamura H, et al. Age as a prognostic factor for late local recurrence of early tongue cancer treated with brachytherapy. *Anticancer Res* 1997; 17(6D):4709-4712.
13. Davidson BJ, Root WA, Trock BJ. Age and survival from squamous cell carcinoma of oral tongue. *Head Neck* 2001;23(4): 273-279.
14. Siegelman-Danieli N, Hanlon A, Ridge JA, Padmore R, Fien DA, Langer CJ. Oral tongue cancer in patients less than 45 years old: institutional experience comparison with older patients. *J Clin Oncol* 1998;16(2):745-753.
15. Atula S, Grenman R, Laippala P, Syrjanen S. Cancer of the tongue in patients younger than 40 years. *Arch Otolaryngol Head Neck Surg* 1996;122(12):1313-1319.
16. Rennie JS, McGregor AD. Intraoral squamous cell carcinoma in patients under 40 years of age. A report of 13 cases and review of literature. *Br J Plastic Surg* 1987;40(3):270-273.
17. Bryne M. Is the invasive front of an oral carcinoma the most important area for prognostication. *Oral Dis* 1998 Jun;4(2):70-77.
18. Langdon JD, Henk JM. Malignant tumors of the mouth, jaws and salivary glands. 2nd ed. London: Edward Arnold; 1995.
19. Langdon JD, Rapidis AD, Harvey PW, Patel MF. STNMP - a new classification for oral cancer. *Br J Oral Surg* 1977;15(1):49-54.
20. Rajendran R. Benign and malignant tumors of oral cavity. In: Rajendra R, Shivapathasundaram B, editors. *Shafer's text book of oral pathology*. 5th ed. New Delhi (India): Reed Elsevier India Private Limited; 2006 p. 143-178.
21. Llewellyn CD, Johnson NW, Warnakulasurya KA. Risk factors for squamous cell carcinoma of oral cavity in young people: a comprehensive review. *Oral Oncol* 2001;37(5):401-418.
22. Iype EM, Pandey M, Mathew A, Thomas G, Sebastian P, Nair MK. Oral cancer among patients under the age of 35 years. *J Postgrad Med* 2001;47(3):171-176.
23. Clarke RW, Stell PM. Squamous carcinoma of the head and neck in the young adult. *Clin Otolaryngol Allied Sci* 1992;17(1):18-23.
24. Lacy PD, Piccirillo JF, Merritt MG, Zequeira MR. Head and neck squamous cell carcinoma: better to be young. *Otolaryngol Head Neck Surg* 2000;122(2):253-258.
25. Pitman KT, Johnson JT, Wagner RL, Myers EN. Cancer of the tongue in patients less than forty. *Head Neck* 2000;22(3):297-302.
26. Pytynia KB, Grant JR, Etzel CJ, Roberts D, Wei Q, Sturgis EM. Matched analysis of survival in patients with squamous cell carcinoma of the head and neck diagnosed before and after 40 years of age. *Arch Otolaryngol Head Neck Surg* 2004;130(7): 869-873.