



ORAL HEALTH STATUS IN PATIENT WITH ORAL SQUAMOUS CELL CARCINOMA, IN RURAL POPULATION

Medical Education

Dr Barnali Devi*	Fellow Head And Neck Oncology State Cancer Institute, Guwahati, Assam *Corresponding Author
Dr Mridul Kumar Sarma	Professor & HOD Department Of Head And Neck Oncology State Cancer Institute, Guwahati, Assam
Dr Mrinmoy Mayur Choudhury	Assistant Professor Department Of Head And Neck Oncology State Cancer Institute, Guwahati, Assam
Dr Asim Debnath	Consultant Department Of Head And Neck Oncology State Cancer Institute, Guwahati, Assam
Dr Uma Roy	Fellow Head And Neck Oncology State Cancer Institute, Guwahati, Assam
Dr Taba Nitin	Fellow Head And Neck Oncology State Cancer Institute, Guwahati, Assam

ABSTRACT

Introduction: Poor oral hygiene is believed to play a role as a risk factor for oral cancer. Squamous cell carcinoma is associated with poor oral health status, various oro-mucosal lesions. Tobacco use and alcohol consumption are the major risk factors for the oral cancer. Other etiologic risk factors include socioeconomic status, maintenance of oral health and diet. **Objectives:** To study the status of oral and dental health in patient with oral squamous cell carcinoma and identify means of maintaining of oral health and deleterious habits in rural population which may be associated with oral squamous cell carcinoma, to study any mucosal lesion which transform into oral squamous cell carcinoma. **Materials And Method:** A total 130 oral squamous cell carcinoma patients were screened. Questionnaires were used to inquire about education, deleterious habits. Oro-mucosal lesions by clinical examination. **Result:** Majority of patients were uneducated(48.5%), have deleterious habits(89.2%), other oro-mucosal lesions present(75.4%), **Conclusion:** Deleterious habits, lack of dental visits, poor oral and dental health, lack of education, poor socioeconomic status associated with increased risk of oral squamous cell carcinoma.

KEYWORDS

INTRODUCTION:

One of the most significant health issue globally is oral cancer, considered as one of the 10 most common types of cancers. In India, it ranks as the first and third most prevalent cancer in men and women, respectively. Squamous cell carcinomas (SCCs) originating from the oral mucosa account for over 90% of cancers in the mouth cancers'. Oral squamous cell carcinomas (SCCs) is a complex disease with multiple factors contributing to its development. While tobacco use and alcohol consumption are the primary risk factors for oral cavity cancer, a small percentage of patients develop OSCC without exposure to these substances or any apparent genetic defects. This suggests the presence of other risk factors, including potential infectious agents, in the process of oral carcinogenesis. In addition to tobacco and alcohol, other factors that have been suggested as potential risk factors for oral cancer include viruses, immune status, socioeconomic status and diet. Studies have shown associations between oral cancer and tooth loss and poor oral hygiene, regardless of age, tobacco, and alcohol consumption. Infections, such as periodontal diseases, may play a significant role in the development of oral cancer. Poor dental health, oral infections, and various oral mucosal lesions have been linked to oral squamous cell carcinoma. These findings indicate that maintaining good oral health and addressing oral infections may be important in preventing oral cancer.

The purpose of the study is to evaluate the awareness and means of maintaining oral health in rural population and to evaluate the risk factors that may be associated with oral squamous cell carcinoma which include premalignant and malignant, red and white lesions of oral mucosa, various ulcerative lesions associated with sharp tooth which have higher tendency of malignant transformation and in patients with poor oral health status in whom the oral squamous cell carcinoma occurrence rate is significantly high.

But to our knowledge, there have been no recent study conducted on rural population that have involved oral squamous cell carcinoma patient and their thorough oral examination. So the present study is undertaken to assess the oral health status of patient with oral squamous cell carcinoma and the association between various oral premalignant lesions to oral squamous cell carcinoma, the affects of deleterious habits of oral mucosa and educate the rural people towards the oral health and the importance of dental check up.

METHODS AND METERIALS:

The study was conducted among the subjects visiting the outpatient department, in the department of Head And Neck Oncology in State Cancer Institute, Guwahati, Assam. This is a prospective observational study. The study comprises of 130 subjects who were identified with oral squamous cell carcinoma. Inclusion criteria of our study were 1) Patients belonging to geographically rural area 2) Subjects diagnosed with oral squamous cell carcinoma 3) Subjects who have not been previously treated for oral squamous cell carcinoma. Exclusion criteria of our study were 1) Subjects who underwent treatment for oral squamous cell carcinoma 2) Subjects with no signs and symptoms of oral squamous cell carcinoma 3) Subject who are undergoing carcinoma treatment. All patients were given oral and written information about the study and consent form was signed by those who agreed to participate. A standardized performer specially designed for the study, covering information on age, education, marital status, medical history, personal history, lifetime history of tobacco use alcohol consumption and smoking was used. A thorough examination of the oral cavity was performed. All patients were examined by same examiner. The examination have been performed before any treatment. Patients were examined under illumination by inspection, palpation and complete oral examination using mouth mirror and periodontal probe.

Statistical Analysis:

Statistical data was analysed by using IBM SPSS from 20.0 version software. For qualitative data analysis chi-square test is applied. For quantitative data analysis t-test is applied for statistical significance. If P-value is <0.05 then it consider as significant.

RESULTS:

Total 130 oral squamous cell carcinoma patients were screened after obtaining ethical clearance from the concerned institutes and informed consent from the patient. 104 were males and only 26 patients were females (Table 1). Age range from 30 to 70 and mean age was 51.85+₋12.69.

Table No.1: Age Wise Distribution Of Cases

Age in years	Number of cases	Percentage
30-40	37	28.5

41-50	32	24.6
51-60	31	23.8
61-70	18	13.8
>70	12	9.3
Total	130	100.0
Mean ± SD	51.85 ± 12.69	

Study observed that, maximum number of cases 37 (28.5%) were belongs to the age group of 30-40 years, followed by 32 (24.6%) of cases were belongs to the age group of 41-50 years, 31 (23.8%) of cases were belongs to the age group of 51-60 years 18 (13.8%) of cases were belongs to the age group of 61-70 years and 12 (9.3%) of cases were belongs to the age group of > 70 years. The mean age of cases was 51.85 years

Majority of the patients had deleterious habits, only 14 patients (10.8%) were diseased without deleterious habits. Gutkha chewing (23.1%) was the most common habits in our study followed by tobacco (22.3%), supari (6.9%) and combination of deleterious habits. (Table 2).

Table No.2: Deleterious Habits Wise Distribution Of Cases

Deleterious habits	Number of cases	Percentage
Only Guthkha	30	23.1
Only Tobacco	29	22.3
Only Supari	9	6.9
Only Smoking Bidi	6	4.6
Only Smoking Cigarette	1	0.8
Consuming only Alcohol	0	0
Guthkha & Tobacco	4	3.1
Guthkha&Alcohol	6	4.6
Tobacco & Alcohol	6	4.6
Guthkha & Smoking Bidi	9	6.9
Tobacco&Smoking Bidi	11	8.4
Guthkha & Smoking cigarette	1	0.8
Guthkha, Tobacco & Alcohol	1	0.8
Guthkha, Smoking Bidi & Alcohol	1	0.8
Tobacco, Smoking Bidi & Alcohol	2	1.5
No deleterious habits	14	10.8
Total	130	100.0

In the present study out 130 sample cases, 30 (23.1%) of cases had deleterious habit of only Guthkha, 29 (22.3%) of cases had deleterious habit of only tobacco, 9 (6.9%) of cases had deleterious habits of only supari taking, 6 (4.6%) of cases had habit of only smoking bidi, 1(0.8%) of cases had deleterious habits of only smoking cigarette, 4 (3.1%) of cases had habit of both guthkha and tobacco use, 6 (4.6%) of cases had habits guthkha and alcohol consumption, 6 (4.6%) of cases had habits of tobacco and alcohol consumption, 9 (6.9%) of cases had habits of guthkha chewing and smoking bidi, 11 (8.4%) of cases had habits of tobacco chewing and smoking bidi, 1 (0.8%) of cases had habits of guthkha chewing and smoking cigarette, 1 (0.8%) of cases had habits of guthkha and tobacco chewing and consume alcohol, 1 (0.8%) of cases had habits of guthkha chewing, smoking bidi and alcohol consumption, 2 (1.5%) of cases had habits of tobacco chewing, smoking bidi and alcohol consumption, 14 (10.8%) of cases had no any deleterious habits.

Most of the patients in rural population were illiterate (48.5%), 26.9% were primary school passed, 8.5% were went till high school and only 8.5% patients were PUC passed (Table 3).

Table No.3: Educational Status Wise Distribution Of Cases

Educational status of cases	Number of cases	Percentage
Illiterate	63	48.5
Primary	35	26.9
Secondary/ High school	21	16.12
PUC	11	8.5
Total	100	100.0

In the present study majority of cases 63 (48.5%) were illiterates, 35 (26.9%) of cases educational status was primary school, 21 (16.12%) of cases educational status was secondary/high school and 11 (8.5%) cases educational status was intermediate or Higher Secondary.

Almost all cases had oromucosal lesions. Oral submucous fibrosis was most common oromucosal lesion in our study (23.1%) followed by

smoker melanosis (20.8%), leukoplakia (14.6%), tobacco pouch keratosis (15.3%), ulcer (0.8%), lichen planus (0.8%). In 5.3% patients could not examine the oral cavity because of restricted mouth opening and 20.8% patients did have any oro-mucosal lesions.(Table 4).

Table No.4: Distribution Of Cases According To Other Mucosal Diseases

Other mucosal diseases	Number of cases	Percentage
Oral submucous fibrosis	30	23.1
Smoker melanosis	27	20.8
Leukoplakia	19	14.6
Tobacco pouch keratosis	20	15.3
Tramatic ulcer	1	0.8
Lichen planes	1	0.8
Could not examine	7	5.3
NAD	27	20.8
Total	130	100.0

In the present study out 130 sample cases, maximum 30 (23.12%) of cases had Oral submucous fibrosis disease, 27 (20.8%) of cases had seen Oral melanotic macule, 19 (14.6%) of cases had Leukoplakia, 15 (11.5%) of cases had Tobacco pouch keratosis, each 5 (3.8%) of cases had Tobacco pouch and NAD and each 1 (0.8%) of cases had Tramatic ulcer and Lichen planes. Whereas 27 (20.8%) of cases were NAD

DISCUSSION:

Squamous cell carcinoma is one of the most common oral cavity cancer globally². The strength of this study is the large number of sample size and examined by the same examiner to avoid bias. The diagnosis of the oral lesions made on the basis of the clinical features according to WHO guidelines.

Males are more frequently affected than females because former deleterious habits are more in males than females. We found 80.0% of the male population was affected by oral squamous cell carcinoma. Mahendra Pratap Singh et al³ conducted a study on Clinico-epidemiological study of oral squamous cell carcinoma: A tertiary care center study in North India and found males were more affected than females and the male-female ratio was 3:1.

Deleterious habits were significantly associated with oral squamous cell carcinoma. Tobacco smoke cause defective DNA damage response by the exogenous carcinogens, which may alter the expression of genes that protect human against cancer that may result in genomic instability⁴. Numerous studies confirmed that use of guthkha, tobacco, areca nuts, alcohol and smoking increase the risk of oral squamous cell carcinoma. Epidemiological studies show that the risk of developing oral cancer is five to nine times greater for smokers than for nonsmokers, and this risk may increase to as much as 17 times greater for extremely heavy smokers of 80 or more cigarettes per day⁵. Smoking habits include cigarettes and bidi. We found in rural area most of cases smoke bidi. Bidi is equally harmful as cigarettes. Alcohol intake was less in our study. But Moore and Catlin Found that 75% of oral cancers develop in that area which is most affected by topical alcohol exposure⁶. In our study most of the cases had habit of guthkha taking(23.1%). Guthkha contains areca nut, piper betel, tobacco, and slaked lime, which are strongest risk factors of oral squamous cell carcinoma. Guthkha chewed by people with bad oral hygiene, there will be very high accumulation of nitrosamines product. The occurrence of the OSCC's risk depends greatly on the composition of the compound which determines the quality of the seeds, the method of using seeds which is associated with oral hygiene, duration of use, the presence or absence of toxin caused by fungi contamination in the seeds, and the presence or absence of other carcinogenic substances such as tobacco and slaked lime. In our study 12.3% patients had habits of use tobacco, guthkha and alcohol in same time. Concomitant use increased incidence of several malignancies, especially head and neck cancers. According to some study prolonged alcohol consumption and smoking exposure augments the risk for a second primary tumor in patients with a previous upper aerodigestive tract tumor⁷. Most of the cases had combinations of deleterious habits which attributed more risk for oral squamous cell carcinoma. But among women with oral squamous cell carcinoma deleterious habits have a negligible influence.

In present studies after taking complete history and thorough clinical examination we found that due to lack of education and lack of awareness towards oral health in rural population affect their oral health negatively¹. In rural population due to poor socioeconomic

status people leave their school in early age and most of the cases didn't prefer school. Most of the cases were illiterate which is 48.5%, 26.9% were high school drop out, 16.1% went primary school and only 8.5% went PUC in rural area due to lack of education and lack of knowledge towards the oral health.

Other oral and mucosal lesions are also common in oral squamous cell carcinoma patients. In our study male had more oro-mucosal lesions than female which is similar to report by Ranjan Agarwal et al⁸. Other oral and mucosal lesions were diagnosed on the basis of medical history and clinical features according to WHO guidelines, the colour atlas of common oral disease. The prevalence of oral submucous fibrosis was higher among the cases in our study (23.1%). In India, one study showed a malignant transformation rate of 7.6 percent for oral submucous fibrosis. Explanation for this is excessive use of guthkha among the cases, which contain areca nuts. Areca nuts is the strongest risk factors for oral submucous fibrosis⁹. The negative effects of areca nut include its physical and chemical irritations. During areca nut chewing, crude fibers will stimulate oral mucosa which induces microtrauma. Leukoplakia was diagnosed with clinical criteria of Axell et al. Zheng et al.¹⁰ and Bundgaard et al¹¹ reported high prevalence of oral leukoplakia among oral squamous cell carcinoma patients as even in our study also we found high prevalence of oral leukoplakia (20.8%) due to excessive smoking habits among patients. We found high prevalence of smoker melanosis in oral squamous cell carcinoma patients in rural areas. Use of excessive tobacco cause continuous irritation of oral mucosa which cause keratosis or white mucosal lesion in the area of the tobacco contact. 15.3% cases had tobacco pouch keratosis over their oral mucosa in our study. Smoker melanosis or melanin pigmentation also found over lip, gingiva, hard palate and soft palate due to excessive use of bidi. Inadequate cleaning cause candidiasis of the tongue, in present study 25.4% cases found candidiasis over tongue. *Candida albicans* is a highly prevalent yeast in the oral cavity which proliferates and invades host mucosal tissues upon epithelial barrier dysfunction or disruption. *C. albicans* invades tissues via hypha formation and the production of associated hydrolytic enzymes and virulence factors¹². *Candida* might induce carcinogenesis by the production of carcinogenic compounds such as nitrosamines. These carcinogens bind to bases, phosphate residues, and/or hydrogen bonding sites of DNA that could interfere with DNA replication. Induced point mutations might activate oncogenes and contribute to the development of oral cancer¹². In our study we found very less prevalence of oral lichen planus among oral squamous cell carcinoma patients. Murty et al. reported a relative risk of 3.3 percentage for an oral lichen planus to develop oral cancer compared with a tobacco user developing an oral cancer¹³.

CONCLUSION

Based on findings in this study, this research identified that improvement of health literacy surrounding oral cancer may be warranted and has helped to identify that educational initiatives targeting both medical providers and patients are needed to reduce the burden of OSCC in the current absence of recommendation for population-based screening in order to improve outcomes associated with early detection. To educate the patients programs should be developed emphasizing the early diagnosis due to its impact on patient's survival rate, quality of life, and treatment costs. Urgent changes in public health programs must be undertaken aiming to target the population using more efficient means, which in turn should take into account the low level of information concerning oral cancer and its main risk factors. Strategies to overcome the present situation should include not only regular dental attendance, but also oral health programs for the prevention of oral cancer. It must also involve a multidisciplinary approach in the early diagnosis of oral squamous cancer with the participation of other health professionals.

Conflict Of Interest

No

REFERENCES

- 1) Rosenquist K, Wennberg J, Schildt EB, Bladström A, Göran Hansson B, Andersson G. Oral status, oral infections and some lifestyle factors as risk factors for oral and oropharyngeal squamous cell carcinoma. A population-based case-control study in southern Sweden. *Acta oto-laryngologica*. 2005 Jan 1;125(12):1327-36.
- 2) Narayan TV, Revanna GM, Hallikeri U, Kuriakose MA. Dental caries and periodontal disease status in patients with oral squamous cell carcinoma: a screening study in urban and semiurban population of Karnataka. *Journal of maxillofacial and oral surgery*. 2014 Dec;13(4):435-43.
- 3) Singh MP, Kumar V, Agarwal A, Kumar R, Bhatt ML, Misra S. Clinico-epidemiological study of oral squamous cell carcinoma: A tertiary care centre study in North India. *Journal of oral biology and craniofacial research*. 2016 Jan 1;6(1):32-5.

- 4) Neville BW, Day TA. Oral cancer and precancerous lesions. *CA: a cancer journal for clinicians*. 2002 Jul;52(4):195-215.
- 5) Bundgaard T, Wildt J, Elbrønd O. Oral squamous cell cancer in non users of tobacco and alcohol. *Clinical Otolaryngology & Allied Sciences*. 1994 Aug;19(4):320-6.
- 6) Agrawal R, Chauhan A, Kumar P. Spectrum of oral lesions in a tertiary care hospital. *Journal of clinical and diagnostic research: JCDR*. 2015 Jun;9(6):EC11.
- 7) Vadovics M, Ho J, Igaz N, Alfoldi R, Rakk D, Veres É, Szücs B, Horváth M, Tóth R, Szücs A, Csibi A. *Candida albicans* Enhances the Progression of Oral Squamous Cell Carcinoma In Vitro and In Vivo. *Mbio*. 2022 Jan 4;13(1):e03144-21.
- 8) Muzio LL, Mignogna MD, Favia G, Procaccini M, Testa NF, Bucci E. The possible association between oral lichen planus and oral squamous cell carcinoma: a clinical evaluation on 14 cases and a review of the literature. *Oral oncology*. 1998 Jul 1;34(4):239-46.
- 9) Bodner L, Manor E, Friger MD, Van Der Waal I. Oral squamous cell carcinoma in patients twenty years of age or younger—Review and analysis of 186 reported cases. *Oral oncology*. 2014 Feb 1;50(2):84-9.
- 10) Bundgaard T, Wildt J, Frydenberg M, Elbrønd O, Nielsen JE. Case-control study of squamous cell cancer of the oral cavity in Denmark. *Cancer Causes & Control*. 1995 Jan;6(1):57-67.
- 11) Balam P, Sridhar H, Rajkumar T, Vaccarella S, Herrero R, Nandakumar A, Ravichandran K, Ramdas K, Sankaranarayanan R, Gajalakshmi V, Munoz N. Oral cancer in southern India: The influence of smoking, drinking, paan chewing and oral hygiene. *International journal of cancer*. 2002 Mar 20;98(3):440-5.
- 12) Singhvi HR, Malik A, Chaturvedi P. The role of chronic mucosal trauma in oral cancer: A review of literature. *Indian Journal of Medical and Paediatric Oncology*. 2017 Jan;38(01):44-50.
- 13) Graham S, Dayal H, Rohrer T, Swanson M, Sultz H, Shedd D, Fischman S. Dentition, diet, tobacco, and alcohol in the epidemiology of oral cancer. *Journal of the National Cancer Institute*. 1977 Dec 1;59(6):1611-8.
- 14) Zheng T, Boyle P, Hu H, Duan J, Jiang P, Ma D, Shui L, Niu S, Scully C, MacMahon B. Dentition, oral hygiene, and risk of oral cancer: a case-control study in Beijing, People's Republic of China. *Cancer Causes & Control*. 1990 Nov;1(3):235-41.