International Journal of Otorhinolaryngology and Head and Neck Surgery
Mahajan R et al. Int J Otorhinolaryngol Head Neck Surg. 2019 May;5(3):628-633
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20191458

A study of etiopathological factors affecting oral malignancy

Ritesh Mahajan*, Saleem Saeed, T. M. Nagaraj

Department of Otorhinolaryngology, Rajarajeswari Medical College and Hospital, Bangalore, Karnataka, India

Received: 13 March 2019
Revised: 28 March 2019
Accepted: 29 March 2019

***Correspondence:**
Dr. Ritesh Mahajan,
E-mail: ritesh54mahajan@gmail.com

ABSTRACT

Background: Malignancies of oral cavity are quite common in India and other developing countries. Oral cancer is one of the ten most common cancers and oral cavity is the second most common site of primary tumors involving head and neck. In this study, we studied etiopathological factors affecting oral malignancy with a view to determine a correlation between the host and environment and additional stress put on oral tissue by social and nutritional factors of population.
Methods: A prospective study was conducted and data for the study was collected from patients presenting with oral malignancy/dysplasia. An informed written consent was taken from patient, and cases meeting the selection criteria were included in the study. A detailed history and a thorough clinical examination were done in about 50 patients.
Results: A total of 50 cases were studied over a period of 18 months. Among study subjects 64% were in the age group ≥50 years. Commonest site involved was buccal mucosa with a preponderance over right side. Chewing was a commonest addictive habits among study subjects. Histopathologically 98% of cases turned out to be "squamous cell carcinoma" of varying differentiation.
Conclusions: Because of different life styles, habits and customs, poor oral hygiene among illiterates compared to literate's oral malignancies are still a major health problem in developing countries like India. Timely surveys and registry programmes will give changing trends in such a grievous health issue.

Keywords: Malignancies of oral cavity, Etiopathological factors of oral malignancy, Prevention of oral malignancy

INTRODUCTION

Oral cancer is a major problem in the Indian subcontinent as it ranks among the top three types of cancer in the country.[1] Oral cancers is one of the ten most common cancers and oral cavity is the second most common site of primary tumors involving head and neck.[2] The incidence of oral cancers is seen more often in patients who indulge in certain habits like smoking, alcohol consumption, betel leaves, betel nut chewing, tobacco chewing, poor oral hygiene, and nutritional factors. According to the National cancer registry programme 2013, mouth cancer is one of the leading sites of cancer among males along with cancer lung, esophagus and stomach.[3] Age-adjusted rates of oral cancer in India is high, that is 20 per 100,000 population and accounts for over 30% of all cancer in the country.[4] The association between use of tobacco and the occurrence of oral cancer was reported over 60 years ago and since then the burden of tobacco-related cancers has been estimated at 40-42% of all cancers among males and 15-20% of all cancers among females.[5] About 20 million children of ages 10–14 years are estimated to be tobacco-addicted, according to a survey done by the national sample survey organization of the Indian government. To this astounding figure, about 5500 new users are added every day, making two million new users every year.[6,7]

Aims and objectives

To study the various etiopathological factors affecting oral malignancies in patients attending the OPD of the

ENT Department at Rajarajeswari Medical College and Hospital, Bangalore.

METHODS

A prospective study was conducted in Rajarajeswari medical college and hospital, Bangalore from 1st October 2015 to 31st May 2017 in the department of ENT, Head and Neck surgery and the patients presenting with lesions in the oral cavity were screened. A total of fifty cases of oral dysplasia/malignancy was taken for study. The study included only histologically proven cases of squamous cell carcinoma of the head and neck. Patients aged more than 18 years of age were included in the study. Written informed consent was taken from all the patients. Patients who were not willing to cooperate, those who refused for the biopsy and those who were unable to provide informed consent were excluded from the study. Patients were studied for various parameters like age, gender, their educational status, first clinical symptoms and time of presentation, site of lesions, the form of tobacco, chewing habits and various other parameters. TNM classification was used to classify tumors. All the data thus obtained was arranged in a tabulated form and analyzed using SPSS software.

RESULTS

50 cases of oral dysplasia /malignancy were studied in detail and observations were made and data were analyzed.

Age and gender

In our study, the majority of the cases (64%) were in the age group of more than or equal to 50 years. The youngest patient was 25 years old and the oldest being 85 yrs. Median age group was found to be 53.5 years. The occurrence of oral malignancy was higher among females (64%) than in males (36%).

Table 1: Smoking pattern among oral malignancy patients.

Smoking	Number (%)	Duration of smoking (in years)	Mean no. Beedies/day	Number	Percentage (%)
Yes	13 (26)	<20	20	1	7.69
		20-29	19	5	38.46
		30-40	18.5	4	30.77
		≥40	13.33	3	23.08
No	37 (74)		-		

Table 2: Chewing habits among oral malignancy patients.

Chewing habit	Number (%)	Duration of chewing (in years)	Mean freq. Chewing/day	Number	Percentage (%)
Yes	47 (94)	<20	6	2	4.26
		20-29	4.8	17	36.17
		30-39	4.6	21	44.68
		40-49	4	5	10.63
		≥40	5	2	4.26
No	3 (6)				

Educational status and clinical presentation

In our study, 34 patients (68%) were uneducated and only 16 patients (32%) were educated. Among the educated, 9 patients (56.25%) had only primary education, 5 patients (31.30%) had high school education, and 2 patients (12.5%) had pre-university degree. Analyses of first clinical presentation of study subjects showed that 52% of cases complained of growth, pain and discomfort, 14% of cases presented with growth and discomfort while 22% of them complained only of discomfort. There was a significant difference in the educational status and the time of notification of the first symptom. 93.75% of the educated patients reported to the hospital on or before 3 months when compared to 73.53% of uneducated patients. Only 6.25% of the educated patients reported before 3 months while 26.47% of the uneducated patients presented only after 3 months.

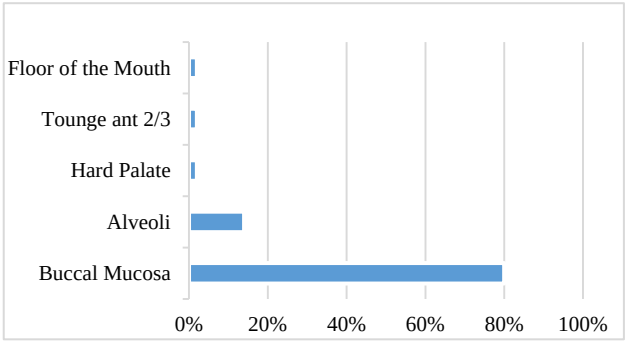

Figure 1: Site of lesion.

Personal habits and form of tobacco

Observations were made on the habit of consumption of alcohol among study subjects, 26% of them were in the habit of taking alcohol while 74% of them were non-alcoholics. Those who were taking alcohol for more than 20 years constitute 84.62%. Smoking pattern varied between study cases, 26% of them were in the habit of smoking & 74% of them were non-smokers. Duration of smoking in years was inversely proportional to the mean number of bidis smoked/day. Tobacco chewing habits of the study subjects were also analyzed, 94% of them were in the habit of chewing while 6% of them were non-chewers. Duration of chewing habit was inversely proportional to the mean frequency of the chews/day. Characteristics of chewing habits showed out of 47 patients (94%), 8 patients (17.02%) were in habit of keeping the chew mix for 2 hours in the mouth, 24 patients (51.06%) were keeping the chew mix for 3 hours, and 15 patients (31.92%) used to keep the chew mix for 4 hours in the mouth, 18 patients (38.29%) were in the habit of quidding, and all of them were females.

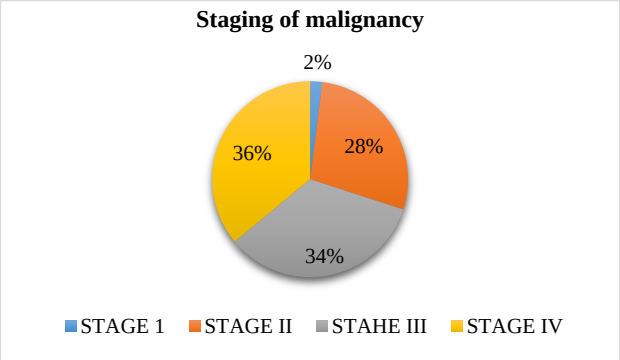

Figure 2: Staging of malignancy.

Site of lesion and histopathological evaluation

In our study, 80% of the patients had the lesions in the buccal mucosa, 14% of them had the lesions in the alveoli, 2% of patients had lesions in the hard palate, 2% had it on the floor of the mouth and 2% of them had the lesions in the anterior 2/3 of the tongue. In 83.67% of the patient's moderately differentiated squamous cell carcinoma was seen, in 14.29% of patients well differentiated squamous cell carcinoma was observed and 2.04% of patients had poorly differentiated squamous cell carcinoma. 70% of the patients belonged to stage III and IV in TNM staging of the malignancy and 30% of the patients were in stage I and II.

Chewing habits and staging

A total of 47 patients had the habit of chewing out of which 18 patients (38.29%) gave the history of quidding, in that 8 patients (44.46%) presented with stage IV malignancy, and 5 patients each (27.77%) in stage II and III. 38.8% of the patients with stage IV malignancy and 29.41% of the patients with stage II malignancy had the habit of chewing betel leaves, lime, tobacco, and spices together. While 35.71% of the subject with stage III malignancy had the habit of chewing betel leaves, lime and tobacco together. 66.66% of cases who presented in stage I and II malignancy had the habit of keeping chewmix in the mouth for less than 3 hours and 90.62% of cases who presented in stage III and IV of malignancy had the habit of keeping chewmix in the mouth for more than 3 hours.

DISCUSSION

Our study of etiopathological factors of oral malignancy had patients from different parts of Bangalore including both rural and urban areas, a total of 50 cases of oral dysplasia/malignancy were studied in detail and analyzed as per proforma.

Age characteristics

According to a study conducted by Coelho et al the maximum incidence of oral cancer was between ages of 50-70.[4] Llewellyn et al in their study found that 4-6% of oral cancer now occur at ages younger than 40 years.[8] In our study, the majority of the cases (64%) were in the age group greater than or equal to 50 years. The youngest patient was 25 years old and the oldest was 85 years with median age 53.55 years. This figure corresponds well with the results of other authors.

Sex distribution

In a study conducted by Rao et al they found that men are two to four times more affected than women due to changes in behavior and lifestyle pattern.[9] In a study conducted by Gupta et al on oral cancer, they concluded that for oral malignancy higher incidence is seen among subpopulations of women in South India compared to the male population because of tobacco usage.[10] In our study male: female ratio was found to be 1:1.78. The occurrence of oral malignancy was higher among females (64%). While in rest of studies, there was a higher incidence among males except few studies, where they observed a higher incidence of oral cancer among females of south India.

Educational status

Study conducted by Reddy et al reported that 75% of the study subjects were illiterate.[12] Rao et al reported a twofold risk of development of malignancy among illiterates.[13] In our study, it was found that 50% of males and 81.25% of females were illiterate and 94% of the subjects were in the habit of taking tobacco in one form or another. Most of the people in our country are in the habit of using tobacco in one form or another without knowing about the carcinogenic effect of tobacco and asymptomatic nature of the precancerous lesions or conditions.

Presenting symptoms and time of presentation of the first symptom

In our study, while considering the first clinical presentation of all the cases, it was found that 52% of them complained of growth, pain, and discomfort, 14% of them presented with growth and discomfort while 22% complained the only discomfort. Considering the time of notification of the first clinical symptom, it was found that 60% of them presented within 2 months while 8% of them presented in 6 months duration. In a study conducted by Van der Waal et al they stated that in case of oral cancer, the term early diagnosis is somewhat misleading because by the time patient first approaches the doctor cancer reaches a measurable size and at that stage, the metastatic spread may have already taken place.[13] Sagar et al reported the duration of presenting symptoms ranging from 2 to 8 months.[14] When the educational status and the time of notification of the first symptom among the patients was correlated, it was noticed that 93.75% of the educated subjects presented on or before 3 months whereas 73.53% of the uneducated cases presented during the same period. Only 6.25% of the literate presented after 3 months, while 26.47% of the uneducated cases presented after 3 months.

Habits

Alcohol

It was observed that 26% of the study subjects were in the habit of taking alcohol while 74% of them were non-alcoholics. A study conducted by Reddy et al noticed that the association of alcohol with the development of oral cancer was insignificant.[11] Llwellyn et al cited that many young patients with oral cancer have never smoked or consumed alcohol, which is recognized risk factors in the older group.[8] According to a study by Cancela et al drinking alcohol is an important risk factor for oral cancer and the risk increases with the number of drinks consumed in a week.[15] Alcohol has been identified as a co-agent, most probably through a topical effect. Although alcohol itself may not cause cancer, but when taken together with resulting protein and vitamin deficiencies and liver damage, they may play part in producing cancer.

Smoking

Smoking includes the use of cigarettes, bidi, and hookah. Bidi smokers are 4 times at risk of developing oral cancer compared to non-smokers.[16] According to a study by Madani et al there is a significant correlation between smoking and oral cancer, an increased risk of oral cancer among bidi smokers was observed compared to never bidi smokers.[17] This could be due to poor combustibility as well as nicotine and tar content which exceeds that of cigarette. The number of bidis smoked per day, a longer duration of smoking and a younger age at starting to smoke was associated with oral cancer. There is also a qualitative difference between bidi and cigarette smoking, due to additional burning of dried temburni leaf. In our study, 26% of subjects were in the habit of smoking and all of them were males. This high incidence among males may be attributed to the social habit in the locality. More over in India bidi smoking is affordable to mass population as it is cheaper than cigarette smoking.

Chewing

In the present series, 94% of the study subjects were in the habit of chewing, out of which 65.96% were females. The commonest combination used for chewing was betel leaf, lime, tobacco with or without spices. According to a study conducted by Balaram et al, they reported 87% of females in the study population and 55% of the male population had a habit of chewing.[18] Muwonge et al in his study reported, out of 282 (163 males and 119 females) 61% of men and 87% of women were smokers and also mentioned a higher number of women chewers.[19] Tobacco produces cancer due to its property of chronic irritation. The irritation is mechanical as well as chemical due to the presence of anthracin, phenanthracin, and benzopyridin. Orr et al hold the view that chemical irritation is due to the formation of alkaloids by the action of lime on tobacco chewed with Areca nuts.[20] Areca nut is a potential cancer-causing agent and has an addictive property similar to caffeine, tobacco, and alcohol and can lead to a high number of cases of submucous fibrosis, which can later become malignant. Lime, besides its catalytic action, might be responsible for removing the protective mucus covering the oral mucosa, thus allowing the tobacco and alkaloids to come in close and intimate contact with it and produce its harmful effects.

The site of lesion

Sankaranarayanan et al found that in the oral cavity, the involvement of buccal mucosa comprised of 59% of cases, followed by 21% cases of tongue.[21] According to the study conducted by Wahi et al the commonest site of involvement in the oral cavity was buccal mucosa (52.3%) and next was tongue (26.9%), among tongue cancer cases the anterior 2/3rd was involved four times more frequently than posterior 1/3rd.[22] In our study, it was observed that the commonest site involved was buccal mucosa 80%, alveoli constituted 14% and 2% each of the hard palate, floor of the mouth and anterior two third of tongue and no lip lesions were found.

Histological type of oral malignancy

In our study, the incidence of squamous cell carcinoma was 98% out of which 83.67% of the cases were moderately differentiated carcinoma. The rest of the 2% comprised of mucoepidermoid carcinoma. The similar higher incidence of squamous cell carcinoma has been reported by Manjari et al (93.3%).[23] Other studies from India and across have reported that, most of oral squamous cell carcinoma cases are diagnosed as

moderately differentiated carcinoma, because of the contribution of etiological factors like betel‑quid and/or tobacco chewing.[24] In its earliest stages, squamous cell carcinoma arises as a firm, raised pearly plaque or an area of roughed irregular mucosal thickening. Often their changes occur on a background of premalignant conditions like leukoplakia and erythroplakia. Paymaster et al have reported that one-third of cases of oral submucous fibrosis can develop into its malignant counterpart.[25]

Staging of malignancy

According to a study conducted by Shenoy et al, they reported that the majority of patients, 82.37% were presented in stage III, around 11.53% presented in stage II and 6.1% in stage IV. None of the patients had presented in stage 1.[26] Sighania V et al reported in their study major bulk of the cases presented to them were in stage IV (72%) while minimum presentation was that of stage I patients.[27] In our study it was noticed that only 30% of cases presented in stage I and II while 70% presented in stage III and IV.

CONCLUSION

This was a brief study of etiopathological factors affecting oral malignancy. Etiologically smoking, alcohol and chewing habits probably act as predisposing factors on malignant tumors of the oral cavity. A definite correlation was found between chewing habits and the development of oral cancer. It is necessary to have a strategy for cancer control and prevention and to identify such high-risk patients. Mass education will be helpful to create an awareness in the public about the harmful effects of chewing habits. Early detection could improve cure rates, as well as lower the cost and morbidity associated with treatment. It is important that cost-effective oral cancer screening and awareness initiatives should be introduced in high-risk populations.

ACKNOWLEDGEMENTS

The authors would like to thank the Department of Otorhinolaryngology, Rajarajeswari Medical College and Hospital, Bangalore, Karnataka, India.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Mahajan R, Saeed S, Nagaraj TM. A study of etiopathological factors affecting oral malignancy. Int J Otorhinolaryngol Head Neck Surg 2019;5:628-33.