

## A Study of Etiological Factors and Histopathology of 100 Oral Cancer Patients of Government Arignar Anna Memorial Cancer Hospital, Karapettai, Tamil Nadu

Antony Sagaya Inba Sekar<sup>1</sup>, C. Arunkumar M.D.S.<sup>2</sup>

<sup>1</sup>Associate Professor, Department of General Surgery, Government Medical College, Omandurar Government Estate, Chennai, Tamil Nadu 600002, India. <sup>2</sup>Assistant Dental Surgeon, Government Arignar Anna Memorial Cancer Hospital, Karapettai, Tamil Nadu 631552, India.

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### Abstract

**Background:** The incidence of oral cancer has significant local variation. In India and other Asian countries, oral and pharyngeal carcinomas comprise up to half of all malignancies, with this particularly high prevalence being attributed to the influence of carcinogens and region-specific epidemiological factors, especially tobacco and betel quid chewing. **Aim:** This is a cross-sectional study of the etiological factors and histo-pathology of 100 oral cancer patients in our institution. **Methods:** This study was conducted among the oral cancer patients who visited the out-patient department in the Government Arignar Anna Memorial Cancer Hospital. A complete history was taken and the patients were evaluated for the presence of risk factors. A study of the histo-pathology report was also done for the 100 patients. **Results:** The incidence of oral cancer is more among males than females. Tobacco is the potent risk factor in several of its forms: smoking, betel-nut chewing and quid. **Conclusion:** The study confirms the usefulness of the programmes aimed at primordial prevention of the oral cancer in the form of preventing the risk factors.

**Keywords:** Histopathology; Etiological Factors.

### Introduction

The incidence of oral cancer has significant local variation. In India and other Asian countries, oral and pharyngeal carcinomas comprise up to half of all malignancies [1], with this particularly high prevalence being attributed to the influence of carcinogens and region-specific epidemiological factors, especially tobacco and betel quid chewing. An increase in oral cancer prevalence among young adults is a cause of special concern. There has been a 60% increase in the number of under 40 years old with tongue cancer over past 30 years. The overall survival percentage has not changed in recent years in spite of extensive research on the biological and molecular aspects of cancer [2]. Oral malignancy including tongue cancer is associated with severe morbidity and less than 50% long-term survival despite advances in treatment (surgery, radiation, and chemotherapy) of oral cancer [3]. The survival of the patients remains very low, mainly due to their high risk of developing a second primary cancer. Thus, early detection and prevention of oral cancer and premalignancy are quite important.

### Aims & Objectives

This is a study of the etiological factors and histo-pathology of 100 oral cancer patients in our institution, Government Arignar Anna Memorial Cancer Hospital, Karapettai, Kanchipuram, Tamilnadu, India.

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**Corresponding Author:** Antony Sagaya Inba Sekar, Associate Professor, Department of General Surgery, Government Medical College, Omandurar Government Estate, Chennai, Tamil Nadu 600002, India.

E-mail: [drasisekar@gmail.com](mailto:drasisekar@gmail.com)

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## Materials & Methods

This study was conducted among the oral cancer patients who visited the out-patient department in the Government Arignar Anna Memorial Cancer Hospital. A complete history was taken and complete clinical examination was done. All the patients were worked up for the staging of the disease. The oral cancer lesions were diagnosed by histo-pathological examination by means of edge-wedge biopsy.

The diagnosed oral cancer patients were evaluated for the presence of risk factors. A study of the histopathology report was also done for all the patients. This study was continued for about 100 oral cancer patients visiting the hospital out-patient department from June 2017 to December 2017. Patient's data were all recorded in a specially prepared proforma. The study was conducted after getting institutional ethical committee clearance.

## Results

Among the 100 diagnosed oral patients, 62% of patients were males and the remaining 38% were females (Figure 1). The incidence was higher among the age group between 50-60 years. Buccal mucosa was the common site, followed by tongue and lower alveolus, in the same order. The least common sites were the commissures of the mouth, hard palate and the retro-molar trigone - each having 1% incidence among the 100-patient group. The incidence of each site of the carcinoma is as given in the Figure 2.

The histo-pathological types of the carcinoma is given as in Figure 3. Well differentiated squamous carcinoma had the highest incidence among the 100 patients, followed by moderately differentiated squamous carcinoma. The carcinoma was higher among the 50-60 years age-group bracket (Figure 4), showing that there should be a median duration of 20-25 years is needed

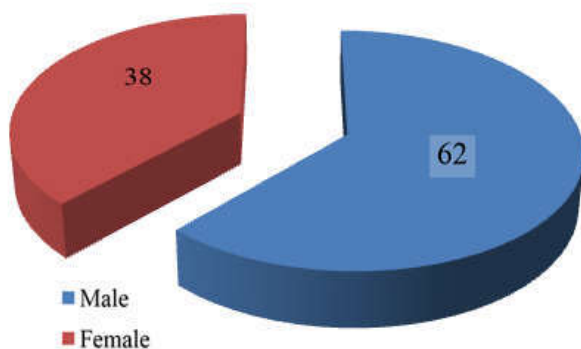


Fig. 1: Sex Ex Distribution

for the exposure of the risk factor, for the carcinoma to develop. The age-group from 40-70 years formed the bulk of the carcinoma among the group, constituting 75% of the patients.

In terms of etiology, hans & alcohol had the highest incidence among the group (24%), with a median duration of 35 years, followed by tobacco chewing, being the risk factor in 18% of patients. Sharp tooth was the risk factor among 10% of patients, among whom 90% (9 patients) were affected with carcinoma tongue. Sunlight exposure was the risk factor in 3% of patients, all of them being affected with carcinoma lower lip. The risk factor analysis also shows that hans alone or in combination with any form of tobacco consumption, was the major risk factor in the causation of oral carcinoma. Consumption of alcohol had additive effects (Figure 5).

## Discussion

### Tobacco and Alcohol

The major risk factors [4] associated with oral carcinomas are tobacco use, in any available forms, and heavy alcohol consumption (people who drink five to eight drinks per day with one drink containing 1.5 oz or 10-15 g of alcohol). The combined effects of alcohol and tobacco smoking have been shown to be synergistic. The risk for developing oral cancer is five to nine times greater for smokers than non-smokers. The mechanism of oral carcinogenesis is induced by the tobacco smoking constituents. Alcohol consumption is correlated to oral cancer because many chemical carcinogens derived from alcohol degradation are metabolized into active forms that have deleterious effects on organisms. Ethanol is oxidized to acetaldehyde, a suspected carcinogen.

### Areca-Nut and Betel-Quid

Another common risk factor is betel-quid and areca-nut chewing [5]. Betel-quid and areca-nut chewing are common social and cultural habits in many parts of Asia. Betel-quid consists of betel leaf, areca nut and slaked lime to which tobacco is often added. Frequent areca nut chewing is carcinogenic to humans; arecoline, an alkaloid present in areca nut, causes cell death, apoptosis, and cell cycle arrest of epithelial cells contributing to the pathogenesis of oral carcinogenesis.

### UV Light and Others

A higher incidence of lip cancer, compared to the one of the labial mucosa, confirms the role of sun exposure in the carcinogenesis rather than tobacco smoking. Lower lip, is typically observed in people who are exposed to sunlight (e.g., fishermen, farmers, skiers and windsurfers).

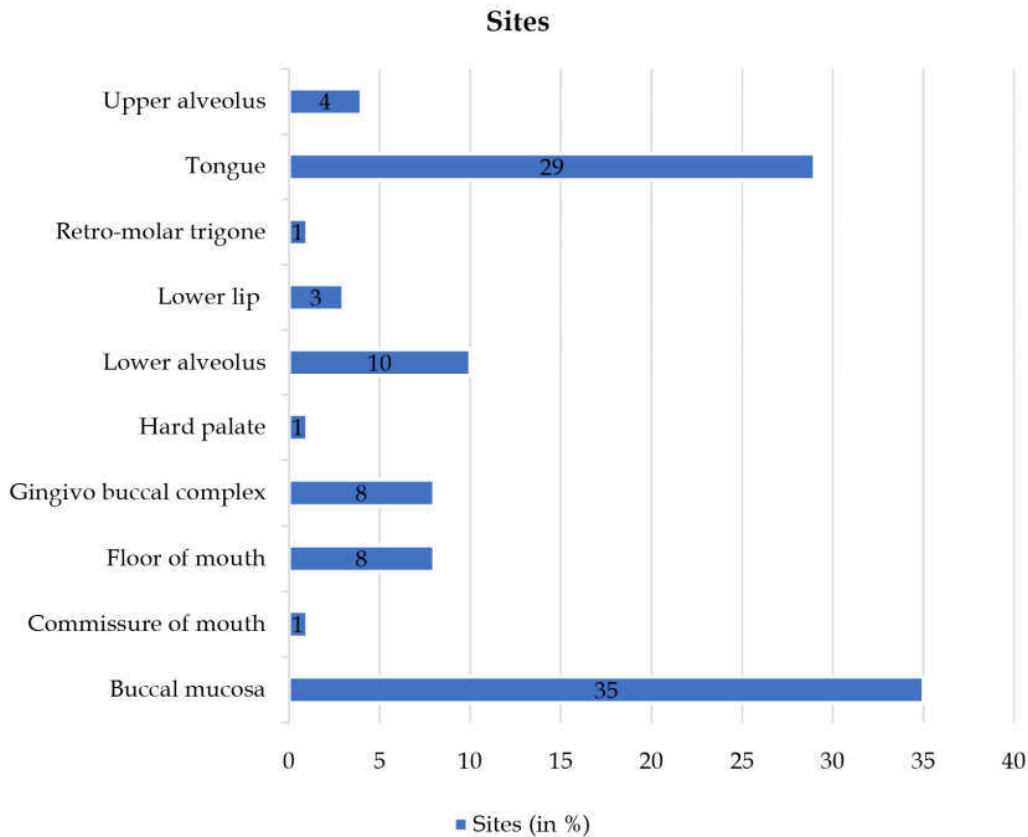


Fig. 2: Sites of oral carcinoma with their incidence

*The Role of Chronic Mucosal Trauma in Oral Cancer*

Chronic irritation has been proposed to be an etiological factor for oral cancer, but we could not find any Level 1 evidence to support this hypothesis. During review of literature, we found retrospective case-control and descriptive studies and a few case series exploring its association with carcinogenesis. Mucosal trauma in oral cavity may be due to ill fitting

denture, broken teeth, sharp teeth, overhanging restoration, and rarely due to implants. Experimental animal studies have suggested that chronic trauma may result in cancer formation by two mechanisms. It has been proposed that persistent mechanical irritation causes DNA damage and may eventually result in cancer formation. This has been proven by increased activity of poly ADP ribosepolymerase in cases with chronic trauma.

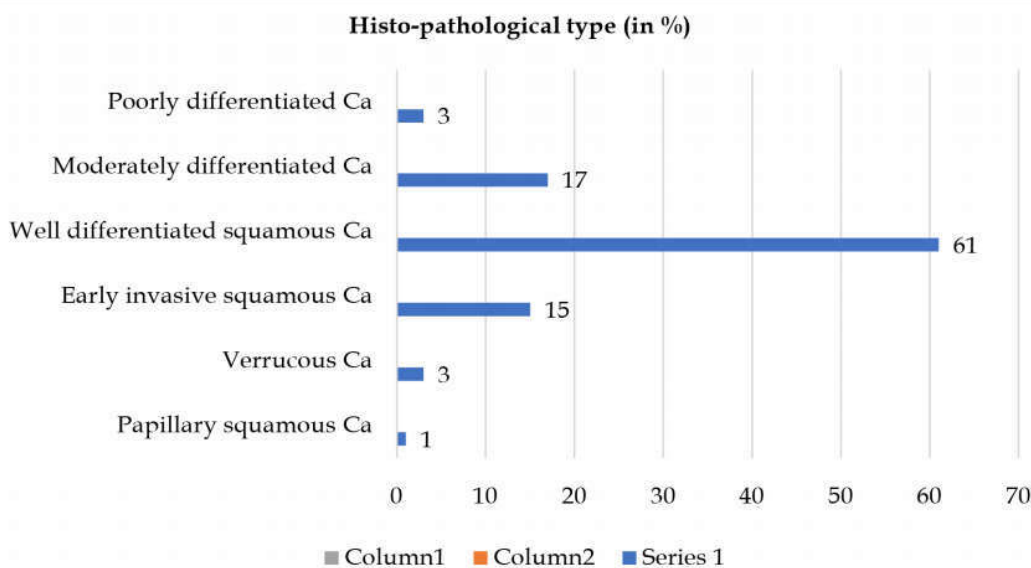


Fig. 3: Histo-pathological types

*Age and Family History of Cancer*

Age indicates a temporal component in the biochemical and biophysical processes of cells that allow malignant transformation or the reduction of the immune system competence. Specifically, the long-term exposure to risk factors may affect the gene products that control epithelial cell proliferation and death resulting in an uncontrolled malignant proliferation of cells. Also, family history of oral cancer plays an important role and is considered a risk factor [6].

In the above study, there was a statistically significant difference among the incidence of males and females (p-value - 0.0475, chi-square test). The incidence of the sites of the oral cancers were not statistically significant among the males and females (p-value - 0.3931, t test). Tobacco, in any form, had a statistically significant association with oral cancer than among non-tobacco consumers (p-value - 0.0001, fisher test).

On comparing with Addalal et al. study [7], the incidence in males and females is quite similar (males - 66.9% vs 62% in our study, females - 33.07% vs 38 in our study). The age distribution is also quite similar to that study (viz) more common in the 50-60 years bracket and 75% of patients belonging to the 40-70 years age group.

Buccal mucosa and tongue constituted the bulk of the oral cancer sites, which is similar to the sites involved in the patients from our study. This was similar to the reports of Iype et al. [8], and Mehrotra et al., and Kuriakose et al.

Buccal mucosa was the commonest site among patients with tobacco chewing, in any of its forms, as a habit (31%). Tongue was frequently involved (in 19%), among those with the habit of smoking/+ alcohol/+ tobacco chewing.

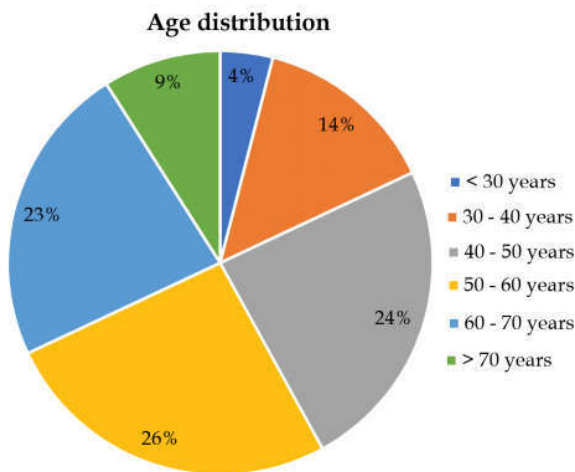


Fig. 4: Age distribution

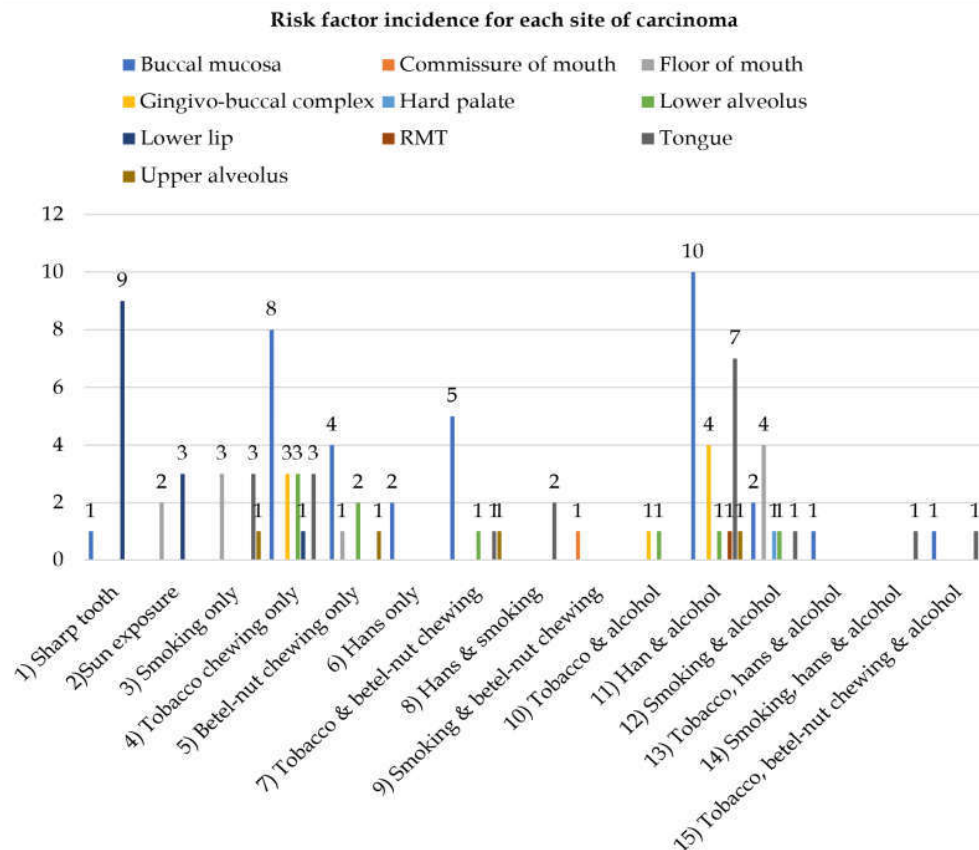


Fig. 5: Risk factor incidence for each site of carcinoma

### Conclusion

The above study shows that the habitual risk factors of smoking, alcohol and betel-nut chewing contributes to the development of oral cancers among the patients who visited our hospital, thereby throwing more emphasis on the primordial prevention of oral cancers.

### Conflict of Interest

The authors acknowledge that there is no conflict of interest with regards to this article.

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