

A RETROSPECTIVE STUDY ON THE INCIDENCE OF MANDIBULAR CARCINOMA IN A UNIVERSITY SETTING

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Abstract

Oral Squamous cell carcinoma is the most common oral cancer. The risk factors of carcinoma include tobacco chewing, smoking, alcohol use, viral infection, immunosuppression, chronic irritation. The aim of this study is to find the incidence of mandibular carcinoma in saveetha dental college.. The study was conducted using the records of patients who visited the Saveetha institute of oral oncology between June 2019-April 2020. The results were tabulated and statistically analysed using SPSS software. Descriptive statistics and chi-square tests were done. Mandibular carcinoma was present among 43.33% of the total study population. Patients with upper arch affected were 26.67% and both arch affected were 30%. Male predominance (92.31%) was seen compared to female (7.69%). The most common age affected by mandibular carcinoma was 40-49 years (46.15%). From this retrospective analysis we conclude that mandibular carcinoma prevalence was higher than maxillary carcinoma and carcinoma affecting both the jaws. There was male predilection with most cases occurring within the 4th decade of life. The most commonly affected site among patients with mandibular carcinoma was buccal mucosa (53.85%). Statistically no significant association was noted between patient age group and gender, age and site of carcinoma in mandible, gender and site of carcinoma in mandible (p value >0.05).

Keywords: Mandibular carcinoma, male predominance, risk factors, tobacco.

I. Introduction

Oral cancers are malignant neoplasms that affect the structures or tissues of the mouth. They may be primary lesions of the mouth or metastasis from a distant site. More than 90% of the head and neck cancer are oral squamous cell carcinoma(OSCC).⁽¹⁾ India is a high risk region for oral and oropharyngeal cancer due to a high prevalence of tobacco use, particularly chewing, smoking and alcoholism in the male population.⁽²⁾ It has been long accepted that tobacco consumption including smokeless tobacco is the main etiological factor for the development of oral cancer. In addition, a variety of suspected risk factors such as chronic irritation, poor oral hygiene, viral infection, occupational exposure, malnutrition as well as low fruit and vegetable diets, genetic factors, have been proposed for the development of oral cancer.⁽³⁻⁵⁾

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Mandibular carcinoma is much more common than other sites of oral cavity, primarily due to pouching of tobacco products in the mandibular gingivobuccal sulcus area. Other sites include lower lip, floor of mouth, retromolar trigone and tongue. Carcinoma may eventually progress to directly invade the mandible, which is associated with a poor prognosis. The main route of entry is through the alveolar crest and lingual cortex. Mandibular carcinomas are graded using TNM staging and treatment is based on the local and metastatic spread of cancer to cervical lymph nodes. Early-stage (I and II) oral squamous cell carcinomas are generally treated with surgical management only and radiotherapy is added based on postoperative histopathological results. Mandibular invasion is one criterion of the American Joint Committee on Cancer classification for the most advanced primary stage (T4) and overall stage (IV) for these tumors. Stage III and IV requires multimodal therapy including surgical management along with post operative radiotherapy, chemotherapy. The 5-year survival rate of patients with stage IV oral lesions with mandibular invasion has been found to be 39%.⁽⁶⁾

There is a wide variation in the prevalence of oral cancer in different regions of the world or even within the same countries. The aim of this study is to report the prevalence of oral carcinoma affecting the mandible among the population visiting the oncology centre.

II. MATERIALS AND METHODS:

Study population:

A retrospective study was carried out among patients who visited the Saveetha institute of oral oncology in Chennai from June 2019-April 2020. A total of 30 patients with Oral carcinoma were selected, among which number of patients with mandibular carcinoma was 13.

Inclusion criteria:

Patients with -

- Squamous cell carcinoma
- Verrucous carcinoma
- Minor salivary gland carcinomas
- Lymphoma

Exclusion criteria:

- Patients with systemic disease
- Patients under the age of 18 years
- Physically challenged
- Patients who underwent radiotherapy and chemotherapy

Ethical approval:

Ethical approval was obtained from the Institutional Ethical Committee and Scientific Review Board of Saveetha Dental College. SDC/SIHEC/2020/ DIASDATA/0619-0320.

Data collection:

Intraoral photographs of the patients were collected from the digital archives of the Dental Information Archive System of the institution between June 2019-April 2020. Gender, age and site specific prevalence was assessed and evaluated.

Statistical analysis:

The data collected was entered in an Excel sheet and subjected to statistical analysis using SPSS software version 23. Descriptive statistics and chi-square analysis were done. Significance level at 5% was seen. Graphs and tables were tabulated.

III. RESULTS:

A total of 30 patients were seen during the study period. Mandibular carcinoma was found to be most common with a prevalence of 43.33% (13 cases) followed by patients with both arch affected who had a prevalence rate of 30% (9 cases) and maxillary carcinoma with 26.67% prevalence (8 cases) [Figure 1]. Mandibular carcinoma was found to have a high male predilection 92.31% (12 cases) than females 7.69% (1 case) [Figure 2]. The age distribution of the study population was found to be highest among 40-49 years (46.15%), followed by 50-59 years (38.46%) and 60-70 years (15.38%) [Figure 3]. Most commonly affected site was buccal mucosa among 7 patients (53.85%), followed by tongue among 4 patients (30.77%) and retromolar trigone among 2 patients (15.38%) [Figure 4].

CHARTS:

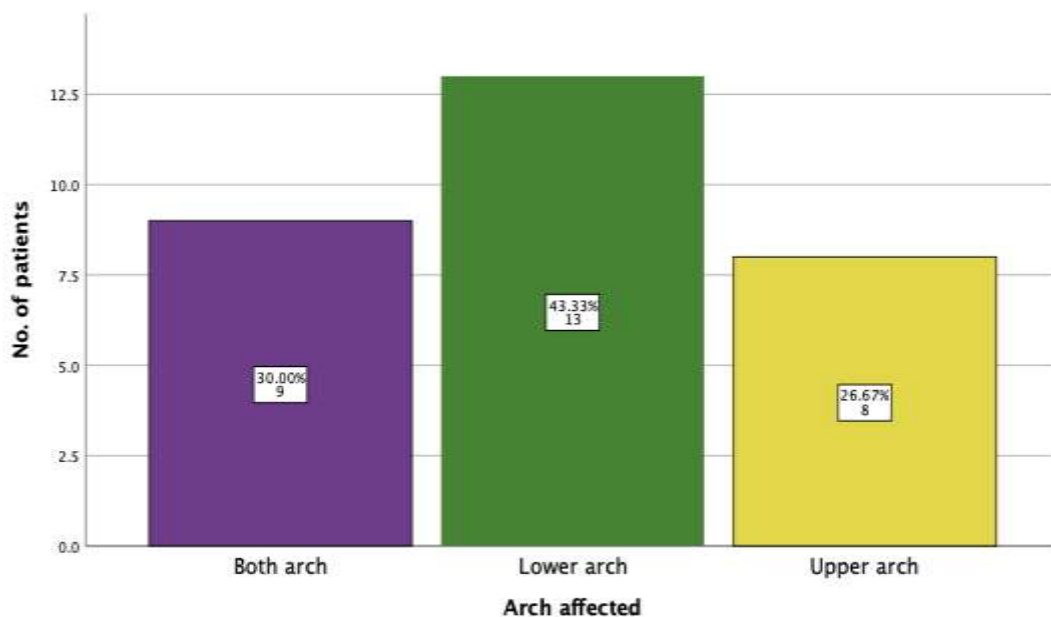


Figure 1: Graph showing the distribution of carcinoma among different arches. X axis corresponds to the arch affected by carcinoma and Y axis corresponds to the number of patients. The colour purple denotes both arches, colour green denotes lower arch and colour yellow denotes upper arch. Prevalence of carcinoma in the upper arch is among 8 patients, lower arch among 13 patients and both arches among 9 patients.

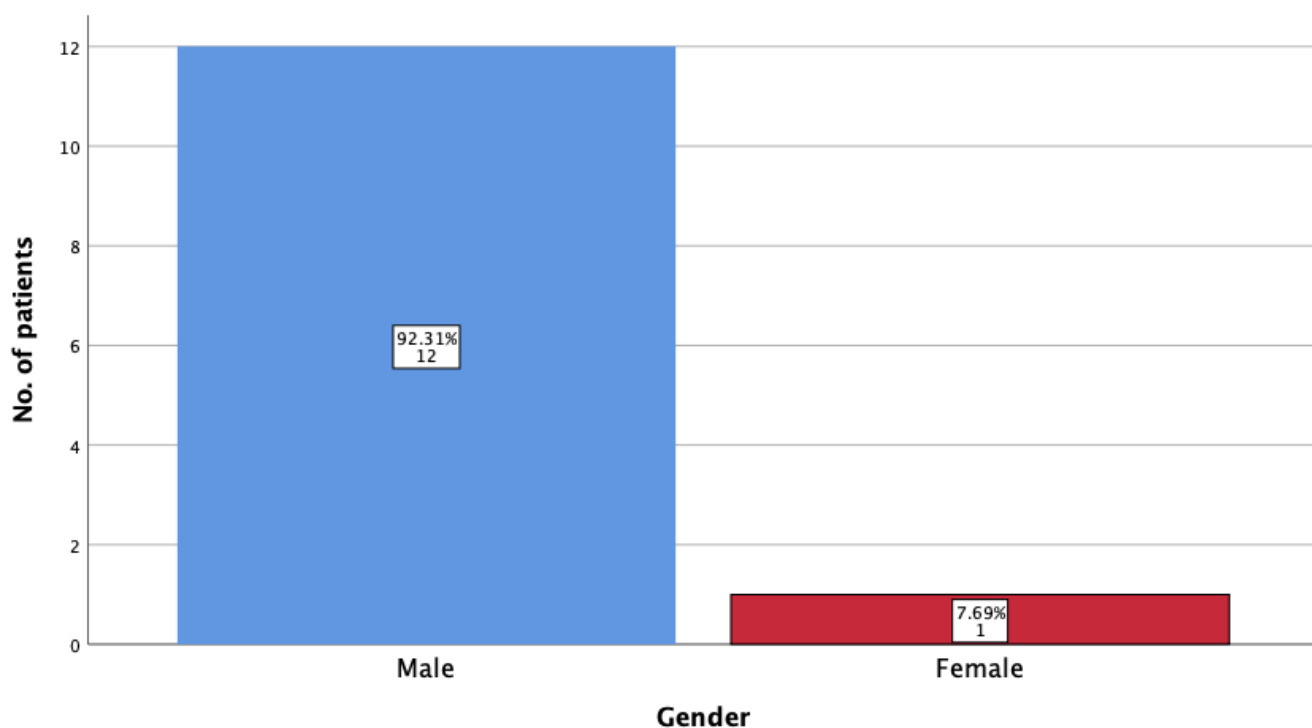


Figure 2: Graph showing the gender distribution. X axis corresponds to the gender and Y axis corresponds to the number of patients with mandibular carcinoma. The colour red denotes females and the colour blue denotes males. Male predilection was 93.31% and female prediction was 7.69%.

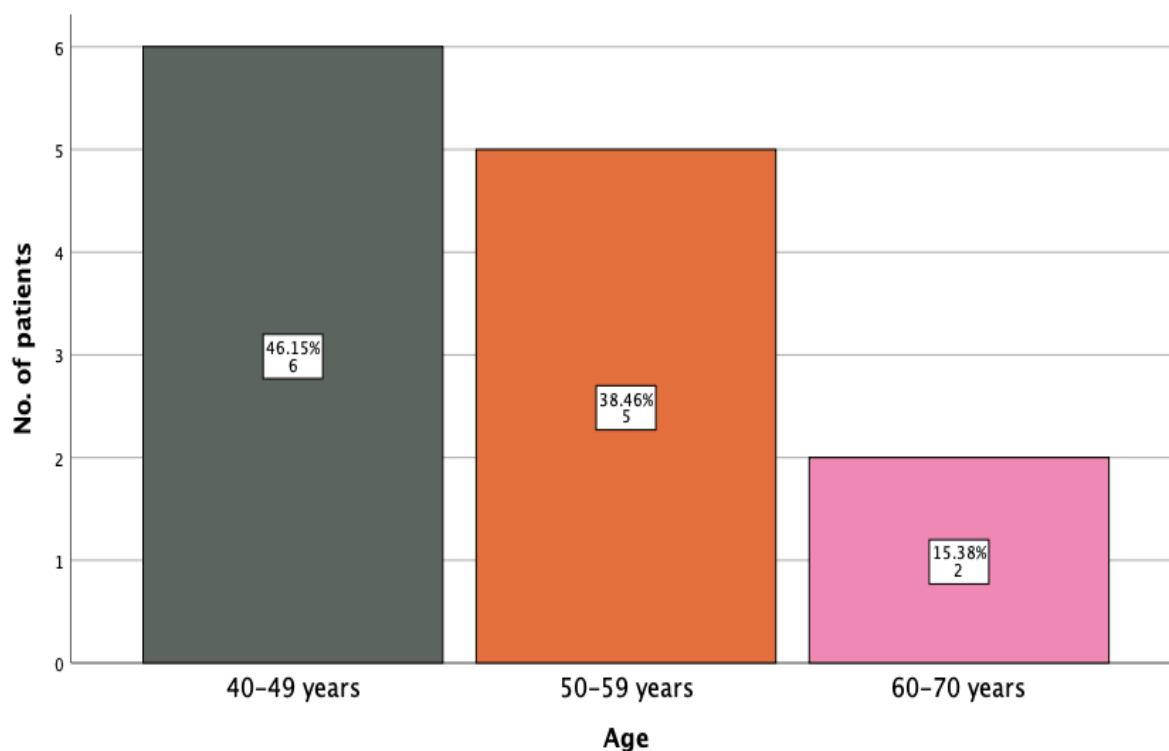


Figure 3: Graph showing the age distribution. X axis corresponds to the age and Y axis corresponds to the number of patients with mandibular carcinoma. The colour light Grey denotes 40-49 years. The highest number of patients were seen between the ages of 40-49 years (46.15%).

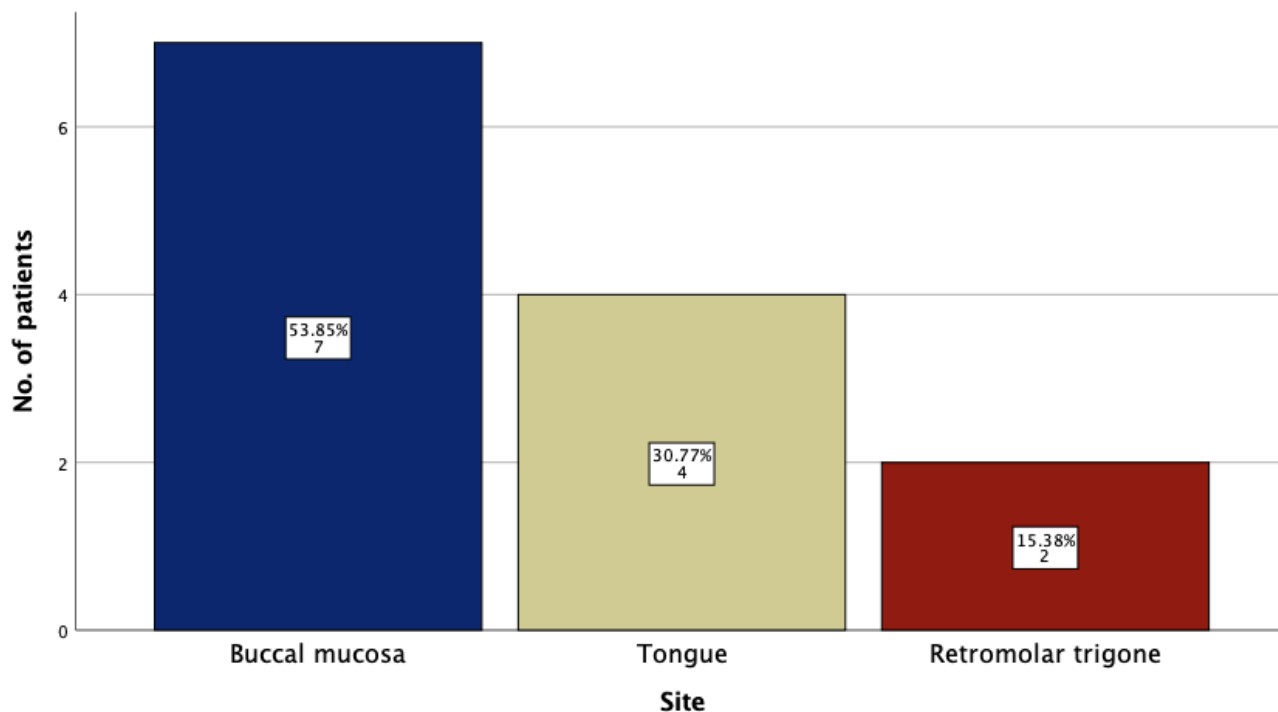


Figure 4: Graph showing the site affected for patients with mandibular carcinoma. X axis corresponds to the site affected and Y axis corresponds to the number of patients. The colour dark blue denotes buccal mucosa. The most commonly affected site was buccal mucosa which was among 7 patients followed by tongue among 4 patients and retromolar trigone among 2 patients.

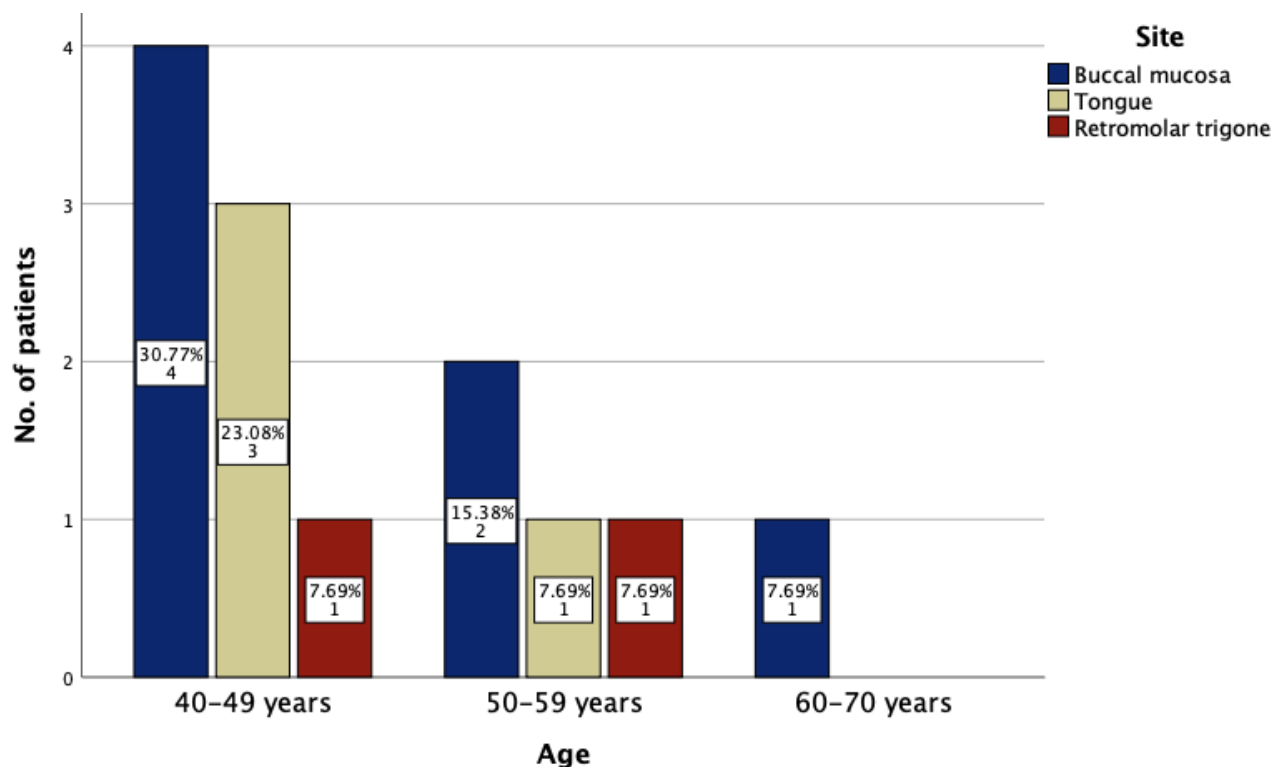


Figure 5: Graph showing the association between age and site affected. X axis corresponds to the age and Y axis corresponds to the site affected. 40-49 years had a higher prevalence of lesions on the buccal mucosa (30.77%) and tongue (23.08%). Chi-square test was done and was found to be statistically insignificant [chi square value- 1.335; p value- 0.885 ($p > 0.05$)]. Even though statistically insignificant, the majority of the study participants among the age group of 40-49 years had lesions on the buccal mucosa.

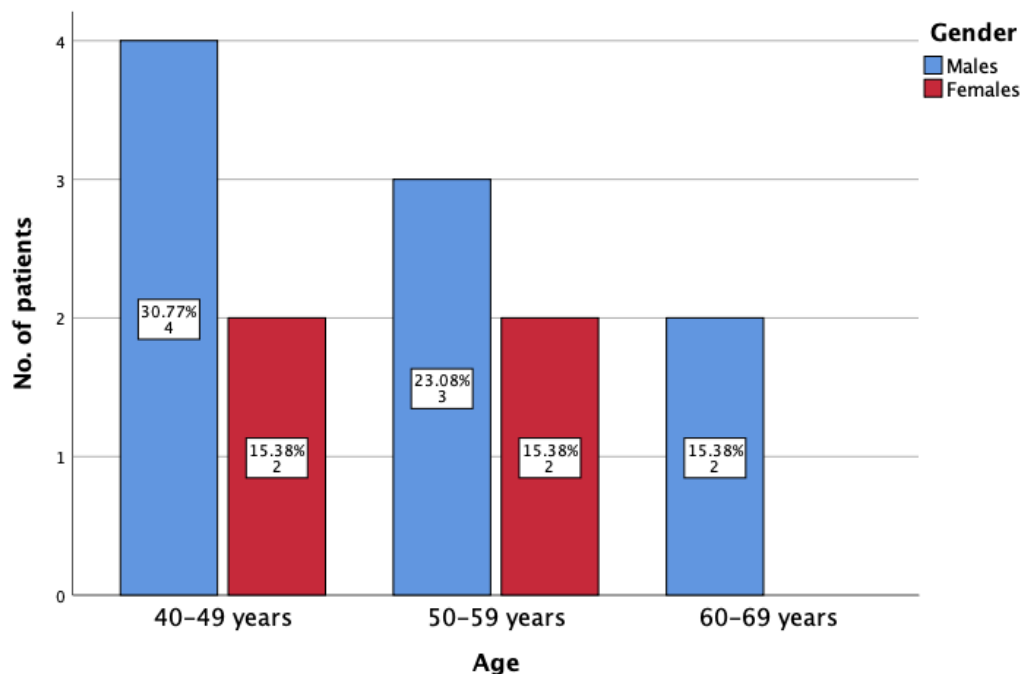


Figure 6: Graph showing the association between age and gender of the study population. X axis corresponds to the age and Y axis corresponds to the gender. The colour blue denotes males and red denotes females. Male distribution was found to be higher among all age groups of the population; 40-49 years with 30.77%, 50-59 years with 23.08% and 60-69 years with 15.38%. Chi-square test was done and was found to be statistically

insignificant [chi square value-1.107; p value- 0.575 ($p>0.05$)]. Even though statistically insignificant, the majority of the study participants among the age group of 40-49 years were found to be males.

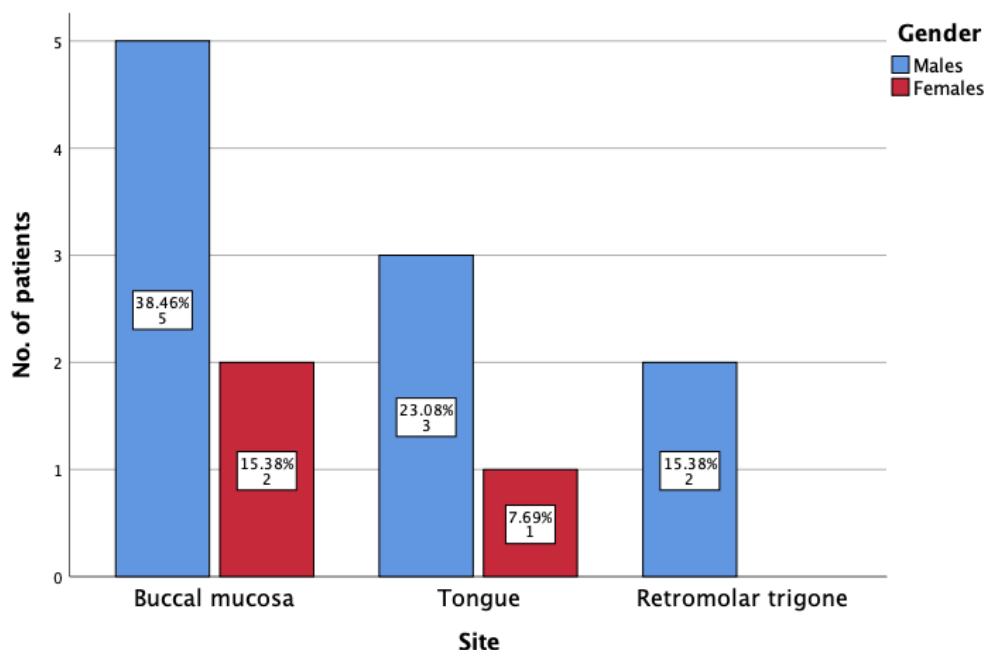


Figure 7: Graph showing the association between site affected and gender of the study population. X axis corresponds to the site affected and Y axis corresponds to the gender. The colour blue denotes males and red denotes females. All three sites namely buccal mucosa, tongue and retromolar trigone were more affected in males (38.46%, 23.08% and 15.38% respectively) than females (15.38%, 7.69% and 0% respectively). Chi-square test was done and was found to be statistically insignificant [chi square value-0.727; p value- 0.695 ($p>0.05$)]. Even though statistically insignificant, males were more affected than females.

The association between age and site affected among patients with mandibular carcinoma was evaluated. It was found that buccal mucosa was the most commonly affected site among the age group of 40-49 years with a percentage of 30.77% followed by 50-59 years with a percentage of 15.38% and 60-70 years with a percentage of 7.69%; this was not statistically significant (p value = 0.855) [Figure 5, Table 1]. The association between age group and gender distribution shows that male distribution was found to be higher among all age groups of the population (40-49 years - 30.77%, 50-59 years - 23.08% and 60-70 years - 15.38%) compared to females (40-49 years - 15.38%, 50-59 years - 15.38%, 60-70 years - 0%); this was not statistically significant (p value = 0.575) [Figure 6, Table 2]. The association between site affected and gender distribution of the population shows that, all three sites namely buccal mucosa, tongue and retromolar trigone were more affected in males (38.46%, 23.08% and 15.38% respectively) than females (15.38%, 7.69% and 0% respectively); this was not statistically significant (p value = 0.695) [Figure 7, Table 3].

IV. DISCUSSION:

From this study we find that the prevalence of mandibular carcinoma was 43.33%. A study by Bahadur S et al states that 56% of oral carcinomas tend to show a mandibular invasion.⁽⁷⁾ Another study shows that 71% of the cases had histopathologic evidence of mandibular invasion.⁽⁸⁾ Differences in these results could be explained due to relatively limited sample size. In this study we find a male predominance of 92.31% which was in accordance with most previous reports.⁽⁹⁻¹²⁾

Oral cancers are known to show geographical variation with respect to the age, site, sex, and stage of diagnosis.⁽¹³⁾ The genesis of the oral carcinoma is a complex process involving the alteration which can be affected by the various risk factors.⁽¹⁴⁾ Cigarette smoking and alcohol consumption are recognised to have the higher risk of mandibular OSCC in the western culture.⁽¹⁵⁾ However in developing countries like India, tobacco and betel nuts, quid chewing contributes to the major risk factor for mandibular carcinoma occurrence.⁽¹⁶⁾

Patients with oral carcinoma of the tongue, floor of the mouth, mandibular gingiva and buccal mucosa; presents with clinically palpable lymph nodes due to the nodal metastasis into the cervical lymph nodes. The management of metastatic mandibular carcinoma includes neck dissection, submandibular dissection, chemotherapy and radiotherapy.⁽¹⁷⁾

Zhang et al. showed in his study that surgery with adjuvant chemotherapy and radiotherapy improved survival in oral squamous cell carcinoma.⁽¹⁸⁾ Most of the oral cancer patients undergo palliative treatment of chemoradiotherapy because the advanced stage of diagnosis may not fit for surgery.⁽¹⁹⁾ Considerable research has been conducted in the field of oral and maxillofacial surgery with relevance to the current population under study.⁽²⁰⁻³⁴⁾ This study attempts to identify the prevalence of mandibular carcinoma among the population. Further studies with a larger population is advised.

V. CONCLUSION:

Mandibular carcinoma is common in India due to the use of tobacco. Early diagnosis and treatment helps reduce the mortality rates. Increasing awareness among patients and early diagnosis helps prevent major invasive procedures. The future scope of this study can be including a larger population and considering the risk factors.

AUTHORS CONTRIBUTIONS:

First author (S.S.Shivanni) performed the analysis, and interpretation and wrote the manuscript. Second author (Dr.Kathiravan Selvarasu) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr.Balakrishna.R.N) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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CONFLICTS OF INTEREST:

There are no conflicts of interest.

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