A Retrospective Analysis of Risk Factors for Oral Cancer in Patients Attending a University Hospital Setting

Research Article

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Abstract

The aim of this study was to report the prevalence of oral cancer and its association with risk factors in patients visiting private dental college. Oral cancer is one of the most commonly occurring cancers. Various malignant diseases that present oral tissues including the mouth, buccal mucosa, gingiva, palate, tongue are grouped under oral cancers. A cross sectional case record study of patients visiting private dental college from the period of June 2019-March 2020 was conducted. Data regarding the demographic details such as age, gender, socio-economic status, habits were recorded. The results were tabulated and statically analysed using SPSS software. There were 50 patients during the time period of June 2019 to April 2020, the highest incidence of age between the 4th and the 6th decade of life. Risk factors such as gutkha mostly affects the buccal mucosa, smoking and paan affects the tongue. Based on gender, gutkha is the main risk factor for oral cancer followed by smoking, sharp cusp and paan in female patients and for males they are gutkha, smoking and paan followed by sharp cusp with a statistically significant difference (p-value<0.05).Proper measures to be taken by both Government and community health sectors by creating awareness among people regarding the possible outcomes of the disease by usage of such products and the risk factors of the disease.

Keywords: Chewing Tobacco; Oral Cancer; Paan; Sharp Cusp; Smoking; Smokeless Tobacco.

Introduction

The sixth most common cancer worldwide is oral cancer and has shown variation in occurrence geographically. Dental professionals consider oral cancer as of paramount importance [1]. The observation by Indian cancer registries says that oral cancer constitutes a major public health problem in India as a common cancer site. In different continents, and also between developed and developing countries, the incidence of oral cancer varies significantly, says Epidemiological studies. The places that are largely attributed to exposure to specific risk factors for oral cancer [1] includes Asia region (India, Sri Lanka, Pakistan and Taiwan), parts of Europe (France, Hungary, Slovakia and Slovenia), parts of Latin America and the Caribbean (Brazil, Uruguay and Puerto Rico), and in the Pacific region (Melanesia and Papua New Guinea) where high incidence rates were reported.

The use of tobacco in various forms, consumption of alcohol and low socioeconomic condition related to poor hygiene, poor diet or infections of viral origin is the reason for the disproportionately higher prevalence of oral cancer in India as one of the five leading cancer in either sex [2, 3]. The major risk factor for cancer of oral cavity is the chewing of betel-quid with tobacco, the most widespread form of tobacco [4]. One of the independent major risk factors for oral cancer is Betel quid with or without tobacco [5]. Oral cancer was one of the most common cancers in countries where such habits were prevalent and had cultural importance in traditional and religious ceremonies [6]. The more frequently reported problems in oral cancer patients apart from tobacco use were ill-fitting dentures, poor oral hygiene, syphilis, inadequate diet, malnutrition and chronic irritation from rough or broken teeth [7].

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The study of geographic variations of cancer risks can be particularly fruitful in generating aetiology hypotheses that could open the doors for investigation of one or more cancers in a place like India with a huge population of diverse cultures, habits and dietary practices.

Understanding the extent of the problem, determining which groups within population are at highest and lowest risks [8], evaluating the allocation of resources for research [9], prevention, treatment and support services of the burden of oral cancers to that of other cancers, these are the many reasons why descriptive oral cancer data for each specific geographic are important [10].

In India, tobacco chewing, smoking and alcohol consumption have become increased social habits and also observed a positive correlation with oral submucous fibrosis [11], lichen planus and leukoplakia with potential malignant transformation [12]. Tobacco alone can lead to worldwide death mostly in developing and under-developed countries [13]. Nearly 5 million deaths occurred worldwide in 2005 and nearly an estimation of 10 million by 2020 [14]. The factors which predispose to oral cancer are termed as risk factors which include tobacco, gutkha, paan, alcohol, sharp cusp, virus, radiation, genetic factors, nutrition, immunosuppressants, syphilis [15] and other occupational hazards [16]. Gutkha in the smokeless tobacco form is most abundantly used in India, which is now banned as a vigorous implementation strategy [17]. Traditional risk factors such as chewing tobacco leaves have been significantly decreased especially among females [18]. Betel quid most abundantly used in South Asia in the smokeless tobacco form [1]. Sufficient research articles have been done in recent times on carcinogenic, mutagenic properties of paan. Many clinical trials [19, 20], reviews [21], lab studies [22-24] and also surveys [25, 26] have been done. The aim of the current study is to observe the association between the risk factors and oral cancer and their prevalence.

Materials and Method

The study setting is the University setting with approval from the Institutional ethics committee, Saveetha University (SDC/SIHEC/2020/DIASDATA/0619-0320). Type III examination procedure included and 50 case sheets verified. A retrospective study was carried out by collecting and analysing patient's records available from the period of June 2019 to March 2020 in patients visiting private dental college. Details of the patients including the gender, age were recorded. Cross verification of the data for error identification was done. Simple random technique followed to minimize sampling bias. Non probability inclusion of all subjects taken as internal validity. External validity criteria are Homogenization, replication and cross comparison.

Data collection was reviewed and analysed from 86,000 patient records between June 2019 to March 2020. Data entered in Microsoft Excel sheet and then transferred to SPSS software. Variable definition process was done using table and graphical illustrations.

Statistical Analysis

Descriptive statistics test and Inferential statistics were used. IBM SPSS version 20.0 statistical software used. The data was summarized and imported to SPSS software to get mean and standard deviation in both categorical and percentage. Dependent variables taken were Age, Gender, Risk factors, Socio-economic status,Habits. Independent variables were Teeth status, Periodontal status, Type of neck dissection. The data were analyzed using the independent sample t test and also Pearson chi- square test. The data then transferred to the host computer and processed through software.

Inclusion criteria

Patients who were diagnosed with oral cancer.

Exclusion criteria

History of previous cancer surgery
Patients with congenital malformations.
Comorbidant conditions.

Results and Discussion

There were 50 patients during the time period of June 2019 to April 2020, highest incidence of age between the 4th and the 6th decade of life (Figure 1) from which 39 were males (78%) and 11 were females (22%) with Male predominance(Figure 2). According to the prevalence of the site, the most common was the buccal mucosa followed by tongue and then the gingivobuccal sulcus (Figure 3). The association between the age and gender distribution of the patients suffering from oral cancer was assessed. Male patients with 46-50 years (4th decade) were more commonly affected followed by the age group of 56-60 years(18.18%). In female patients, 56-60 years (20.51%) were more affected with oral cancer followed by the age group of 41-45 and 61-65

Figure 1. Bar diagram represents percentage distribution based on age of patients affected with oral cancer. X-Axis represents the age groups and Y axis represents the percentage distribution of oral cancer patients. 20% of the patients affected by oral cancer belong to 46-50 and 56-60 years of age.

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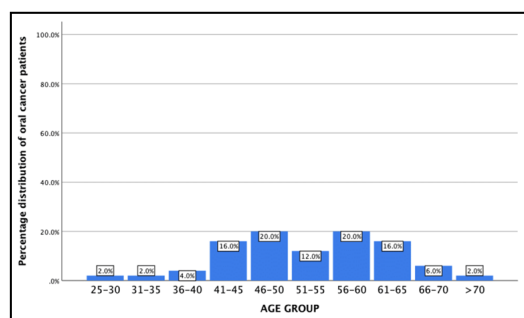
Figure 2. Bar diagram represents the percentage distribution of the oral cancer patients based on gender. X-Axis represents the gender distribution of oral cancer patients and Y axis represents the percentage distribution of participants. Male patients(78%) are affected more commonly when compared to female patients(22%).
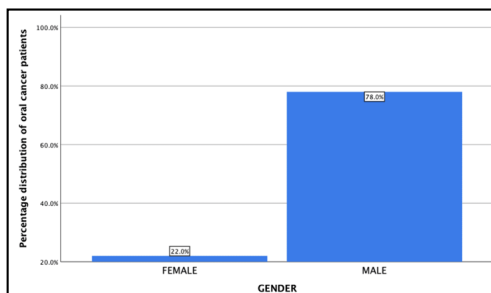

Figure 3. Bar diagram represents the percentage distribution of the oral cancer patients based on site of occurence. X-Axis represents the site of occurrence of oral cancer and Y axis represents the percentage distribution of oral cancer patients. Buccal mucosa(40%) affected more commonly when compared to other sites of occurrence.
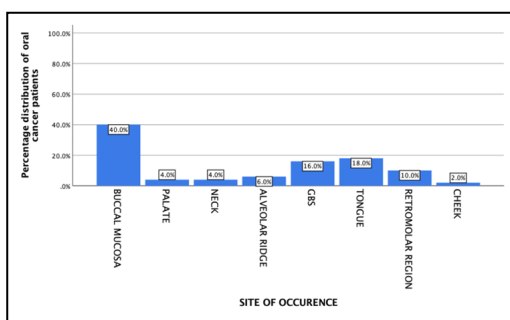

Figure 4. Bar diagram represents the association between the age and gender distribution of the patients suffering from oral cancer. X-Axis represents the age group distribution of patients and Y axis represents the percentage distribution of oral cancer patients. Chi-square association between the age and gender was done and was found to be statistically significant[(Pearson Chi-Square:10.81; p-value-0.02)p<0.05]. Female patients(36.36%) were more commonly affected in 46-50 years of age when compared to males(15.38%).
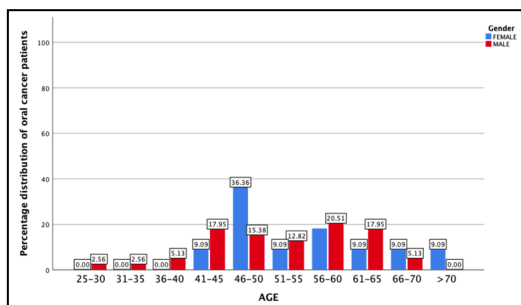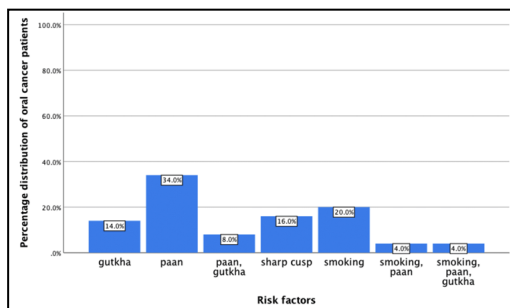

Figure 5. Bar diagram represents the percentage distribution of oral cancer patients based on risk factors. X-axis represents the risk factors of oral cancer patients and Y-axis represents the percentage distribution of oral cancer patients. Paan(34%) is the most common risk factor of oral cancer followed by smoking (20%), sharp cusp(16%) and gutkha(14%).

years(17.95%)(Figure 4). The relationship between the age and the site i.e 46-50 years, with the most common site as buccal mucosa was statistically significant with a p-value of 0.002. Distribution of patients based on risk factors, gutkha which is about 14%, paan which is about 34%, paan and gutkha which is about 8%, sharp cusp which is about 16%, smoking which is about 20%, smoking and paan which is about 4% and smoking, paan and gutkha which is about 4%. Paan is the most common risk factor of oral cancer among all the others (Figure 5).

Association between the site of occurrence and risk factors of the patients.Risk factors such as gutkha mostly affects the buccal

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mucosa (71.4%), smoking and paan affects the tongue (50%) and the gingivobuccal sulcus(50%), smoking alone affects the buccal mucosa (60%) and retromolar region (25%), sharp cusp affects the tongue (20%) and buccal mucosa (12.5%). Therefore, gutkha is the most common risk factor which mostly affects the buccal mucosa (Figure 6). Association between the gender and risk factors of the patients. Based on gender, for females gutkha is about 57.14%, paan is about 11.76% and sharp cusp is about 12.5% and smoking is about 40%. For males, gutkha is about 42.8%, paan is about 88.24% and sharp cusp is about 87.5% and smoking is about 60%. Therefore, gutkha is the main risk factor for oral cancer followed by smoking, sharp cusp and paan in female patients and for males they are gutkha, smoking and paan followed by sharp cusp with a statistically significant difference (p-value<0.05) (Figure 7).

Buccal mucosa was the most common site of occurrence for both males and females in the current study followed by tongue and then gingivobuccal sulcus with the least cheek. The results of the current study were in accordance with the previous studies which also had buccal mucosa as the most common site. Western countries had recorded more cases in the tongue and floor of the mouth, may be due to consumption of alcohol and habit of smoking. The stage and grade of oral cancer is important during the time of detection as it determines the prognosis and treatment plan [27]. Depending on the stage and site of oral cancer, treatment such as chemotherapy, surgery, tele therapy [26], brachytherapy are being planned out. Medications can be used as one of the treatment modalities in the earlier stage of cancer. Early stage of development shown if diagnosed gives better treatment outcomes. Dentists have responsibility and must be able to diagnose

cancer in earlier stages. In India the disease prognosis is worsened due to the late detection and diagnosis of oral cancer [28].

According to, based on the risk factors, paan is the most common risk factor for oral cancer. Other risk factors are smoking, sharp cusp and gutkha. Association between the gender and risk factors was done. Smoking, paan, gutkha were the most common risk factors for oral cancer occurrence in males. Whereas, gutkha, smoking and sharp cusps were common among the females. The current study showed the percentage of patients affected by oral cancer were males and these many females. Previous study results showed that women who smoke are at higher risk of cancer [29]. This study does not correlate with the above mentioned study as male are at higher risk due to increased association with the risk factors. Another study had female predominance affected by cancer without tobacco and alcohol as their risk factors but associated with smokeless tobacco [30]. Occurrence mostly on the buccal mucosa, tongue, alveolus [31, 32]. Another study concluded that 50% of the affected population were either active smokers or had a history of smoking [33]. Other risk factors such as sharp teeth, fractured teeth and poor oral hygiene status also aid as the risk factors for oral cancer [34]. Lesions mostly occur in the site where the risk factors come in contact for example in smokers, the palate is the most common site of occurrence, sharp cusp the tongue or the buccal mucosa [35]. All the factors such as the age, gender and the risk factors are equally associated with the cancerous lesions. In western countries, females are more associated with the risk factors and therefore the 1:1 ratio is changed [35]. Other studies have concluded that 32% of the population are affected who consumed tobacco for 5-10 years, 22% of the population for more than 20 years [35]. Another study concluded that the 6th decade is

Figure 6. Bar diagram represents the association between the site of occurrence and risk factors of oral cancer patients. X-axis represents the risk factors of oral cancer and Y-axis represents the percentage distribution of oral cancer patients. Chi-square association between the site of occurrence and risk factors was done and was found to be statistically insignificant [(Pearson Chi-Square:7.23; p-value-0.32) p>0.05]. Although it is statistically not significant, clinically sharp cusps have more correlation with tongue cancers and Gutkha in alveolar ridge region and buccal mucosa region.
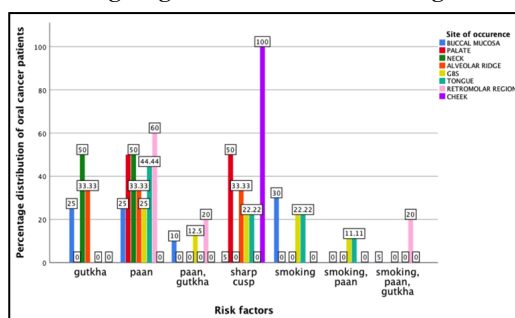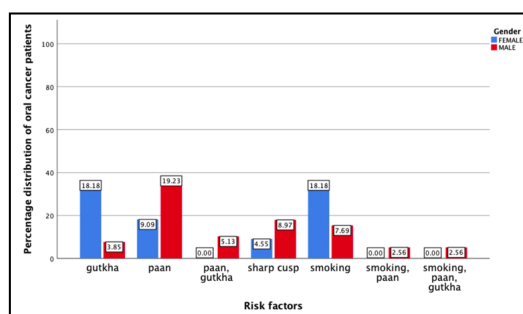

Figure 7. Bar diagram represents the association between the risk factors and gender of the oral cancer patients. X-axis represents the risk factors of oral cancer and Y-axis represents the percentage distribution of the oral cancer patients. Chi-square association between the gender and risk factors was done and was found to be statistically significant [(Pearson Chi-Square:11.23; p-value-0.02)p<0.05]. Gutkha(18.18%), smoking (18.18%) followed by paan (9.09%) are the common risk factors among females(blue). Paan (19.23%), sharp cusp(8.97%) and smoking (7.69%) are the common risk factors among males(red).

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the most common age for occurrence for oral cancer [29].

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Conclusion

From the above study it is evident that Paan chewing was the most common risk factor encountered in this study within some limitations. The most common site of occurrence was buccal mucosa with incidence of 40% and among the paan chewers, Buccal mucosa was the most common site of occurrence. Male predilection is more when compared to female with 4th and 5 th decade of life being more prone to oral cancer. These findings provided in the study will further aid in creating awareness among people by sorting out the possible risk factor of the disease. Proper measures to be taken by both Government and community health sectors by creating awareness among people regarding the possible outcomes of the disease by usage of such products and the risk factors of the disease. Limitations of this include small sample size and ethnic group of population. Further studies are needed in a large scale population to study the possible risks of oral cancer to aid in better prevention protocols and treatment outcomes.

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