ASSOCIATION OF ALCOHOL, SMOKING, AND BETEL QUID CHEWING WITH ORAL CANCER - A RETROSPECTIVE STUDY

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ABSTRACT:
Oral Cancer is one of the most common life threatening diseases in India. Tobacco smoking, betel quid chewing and alcohol drinking are risk factors for Oral Cancer. Observational studies unanimously report that Oral Cancer risk in smoking-drinking-betel quid chewing exposed subjects is exceptionally high. Therefore, this study was aimed at evaluating the association between smoking, alcohol consumption and betel quid chewing with Oral Cancer in a retrospective manner. In this study conducted from June 2019 to March 2020, the clinical records of patients with Oral Cancer were evaluated. Data regarding age, gender, presence of habits were obtained from the records of the private dental college. Chi-square test was used to determine correlation between variables, while the Chi-square test for trends was used to assess the frequency of Oral Cancer patients with smoking, alcohol consumption and betel quid chewing habit. Oral Cancer was found prevalent among patients who reported with the habit of betel quid chewing (67.7%) than tobacco smoking and alcohol consumption habits. The mean age group of occurrence was reported to be 51-70 years (46.7%) with higher incidence among males (83.3%). The results of this study show that, although betel quid chewing was a major cause for development of Oral Cancer. Tobacco smoking and alcohol consumption has a modifying effect in the development of Oral Cancer. Therefore, habitual cigarette smokers, alcohol consumers, and betel quid chewers have a higher risk of contracting Oral Cancer and should receive oral screening regularly so potential Oral Cancer can be detected as early as possible.
INTRODUCTION:

Oral Cancer is currently a major global health issue. In developing countries like India, oral cavity cancer is estimated to be the third most common malignancy after cancer of the cervix and stomach, and the second most frequent cause of death from cancer among males. These high incidence and mortality rates are due to lifestyle risk factors such as tobacco smoking, betel quid chewing and alcohol drinking.[1] Tobacco smoking and alcohol abuse are involved in the pathogenesis of oral cavity cancer, and the two agents appear to act synergistically.[2],[3],[4]

Smoking in general, appears to increase the risk of Oral Cancer, but similar to other studies in India, no association was found between filtered cigarette smoking and the risk of Oral Cancer. In India, where Oral Cancer is a striking incidence, only less than one-fifth (19%) of tobacco consumed is in the form of cigarettes. About one-fourth of tobacco consumption is in smokeless form.[5] Smokeless tobacco (SLT) is consumed in a wide range of types; from chewable tobacco not mixed with any other ingredient to a mixture of tobacco with other ingredients such as in betel quid, Gutkha and paan masala.[6] Betel quid or areca nut, has also been implicated as one of the ingredients that can cause Oral Cancer.[5],[7] have shown evidence on the carcinogenicity of areca nut, where 68% of South African Indians with cheek cancer are areca nut chewers, who do not smoke or drink. Conversely, Stitch reported that in Guam, where arecanut is chewed alone or with leaf only, there is apparently no increase in Oral Cancer.[8] According to Sankaranarayanan et al, although alcohol consumption alone was not independently associated with Oral Cancer, it did seem to enhance the risk of developing the disease when used in combination with the other two habits. Tobacco quid chewing was the most potent risk factor for buccal and labial cancers, although the separation of risks due to tobacco and betel quid chewing alone was difficult.[9]

The Oral Cancer risk in individuals exposed to smoking, drinking and betel quid chewing is often higher than the sum of the individual risks of smoking, drinking and betel quid chewing. Such an additional risk due to concurrent exposure is termed the interaction or joint effect.[5] The hypothetical interaction effect of smoking, drinking and betel quid chewing on Oral Cancer has not yet been estimated.[6] Previously our team had conducted numerous clinical trials [10–15], in-vitro studies [16–19] and systematic reviews [20–24] over the past 5 years. This experience led us to work on the current topic. Therefore, this study aimed to investigate the relationship between smoking, alcoholic consumption, and betel quid chewing and Oral Cancers in a retrospective manner.

MATERIALS AND METHODS:

Study Setting: This present study was conducted as a retrospective cross sectional study with consecutive non-probability sampling among the patients visiting a private college. The study setting was a University setting.
The present study was ethically approved by the Institutional Ethical Committee [SDC/SIHEC/2020/DIASDATA/0619-0320]. The patients included in this study had visited the Department of Oral Medicine. The study was done in the time period of June 2019 to March 2020. The study sample included both male and female genders but were mostly south Indian population due to geographic limitations.

Data Collection: The data collected from the patients were demographic data (Age, Sex, Marital Status, Occupation, Address, Personal habits like tobacco smoking, betel quid chewing and alcohol consumption etc. The total number of patient’s case sheets reviewed in the present study was 30 case sheets. The inclusion criteria for the study was patients who had Oral Cancer and also case sheets which were completely filled. The patients with other premalignant lesions and case sheets which do not have complete details were excluded from the study. Sampling bias was done to minimize simple random sampling. The final total sample size of the data was 30 patients. Any gross data which had the possibility of bias and could affect the studies was not included in the study. All the collected data was cross verified by photographic examination and histopathological report.

Data Analytics: Data was entered into a spreadsheet using Excel version 16.37 (Microsoft Corp, Redmond, Wash). The data tabulation in excel was according to S. no, PID, Age, Gender, presence of habits. The data collected was analysed using Statistical Package for Social sciences (SPSS) software, version 1.0.0.1347 64 bit (IBM corp., NY, USA). The data was assessed by being subjected to descriptive analysis with the help of frequencies, percentages. The data was represented by the means of bar graphs. Non parametric Chi square test was used and results were correlated and associated. In this present study, the significance level was predetermined at the probability value of 5% or less. \( p<0.05 \) was considered to be as the level of statistical significance.

RESULTS:
The study included 30 patients with Oral Cancer. The patients were ranged in the age groups of 30-40 years, 41-50 years and 51-70 years. (Graph-1) shows that Oral Cancer was most commonly seen in the age group of patients 51-70 years (46.7%) and least common in the age group of 30-40 years (10%). (Graph-2) shows that Oral Cancer was most commonly seen among male patients (83.3%) than female patients (16.7%). (Graph-3) shows that among different types of habits, Oral Cancer was found prevalent among patients who reported with the habit of betel quid chewing (70%) than alcohol consumption (16.7%) and tobacco smoking habits (13.3%). (Graph-4) shows association of patients with Oral Cancer and habits according to different age groups. Oral Cancer was most commonly seen in the age groups of both 41-50 years (47.6%) and 51-70 years (47.6%) and least common in the age group of 30-40 years (4.8%) and was most prevalent among patients with betel quid chewing habit. Chi square test was performed. \( P \text{ Value} = 0.075 \) (\( P>0.05 \)) was found to be statistically not significant. (Graph-5) shows association of patients with Oral Cancer and habits according to gender. Oral Cancer was most commonly seen...
among male patients (76.2%) than female patients (23.8%) and was most prevalent among patients with betel quid chewing habit. Chi square test was performed. P Value = 0.276 (P>0.05) was found to be statistically not significant.

DISCUSSION:
Oral Cancer was more prevalent in patients with habits of betel quid chewing (67.7%) than tobacco smoking (13.3%) and alcohol consumption (16.7%). This finding is in line with the study conducted in Taiwan, which stated that the independent and combined use of these substances is common and attempts had already been made to analyze the relationship between betel quid chewing and Oral Cancer in 1976.[25] According to Ko et al., a significant association was found between betel quid chewing and Oral Cancer alone.[4] The present study confirmed the previous findings [26],[27] that showed smokeless tobacco users and other oral dipping consumers were more at risk to develop Oral Cancer. Smokeless tobacco and poly-ingredient oral dipping products may have a stronger effect than smoking because of the direct contact of the ingredient carcinogens with the oral epithelium. However, the etiologic role of these factors is not well understood, and further methods for modifying them need to be developed. Van Wyck et al have shown evidence on the carcinogenicity of areca nut, where 68% of South African Indians with cheek cancer are areca nut chewers, who do not smoke or drink. Similarly, there is a strong cause and effect relationship between areca nut chewing and oral submucousfibrosis in the South African and Indian studies.[7] It is contradicting to the finding of, Stitch who reported that in Guam, where areca nut is chewed alone or with leaf only, there is apparently no increase in Oral Cancer. It may be due to the procedure of preparing the product.[8]

The present study reported that the prevalence of Oral Cancer were commonly seen in patients in the age groups of both 41-50 years (47.6%) and 51-70 years (47.6%) which is similar to the findings of the study by Liu et al., who reported that the median age of prevalence of oral cancer was 51.0 years.[28] Hence, it is easy to understand why patients aged in 41–70 years in this study were more likely to develop oral cancer. On the other hand, prevalence of Oral Cancer was least commonly seen in patients in the age group of 30-40 years (4.8%) in this study which is in accordance with the study of Lin et al., who reported that only 17 out of 2,368 patients (0.7%) under the age of 40 in his study were proven to have oral cancer. Thus, it might be reasonable to start oral mucosa screening of males when they reach the age of 40.[29] In our study, we found that Oral Cancer was most commonly seen among male patients (76.2%) than female patients (23.8%) which is similar to a study by Varshita et al., who reported that men’s face twice the risk of developing oral cancer when compared to women’s.[30]which is contradicting to the study by Muscat et al., who reported that women are at higher risk of developing oral cancer than men due to nutritional deficiencies. [31]

In general tobacco Smoking and alcohol consumption appears to increase the risk of Oral Cancer, but similar to other studies in India no association was found between filtered cigarette smoking and the risk of Oral Cancer. However, According to studies in India, bidi smoking being affordable to most of the population is more common than cigarette smoking. These aspects may explain bidi being a factor for an increased risk of Oral Cancer in
India.[26],[27] There were certainly some limitations in this study. First, the external validity of the findings is limited because the study was conducted at a single institution and only included patients visiting the hospital for oral problems. Secondly, we did not obtain information regarding quantities and duration of consumption.[29] Hence, further studies on dose-response relationship of these three risk factors for Oral Cancer should be demonstrated.

CONCLUSION:
The present study reported that Oral Cancer was found prevalent among patients who reported with the habit of betel quid chewing habit than tobacco smoking and alcohol consumption habits and the mean age group of occurrence of Oral Cancer was found to be 51-70 years with higher incidence among males. The present study showed a significant association between chewing of betel quid with Oral Cancer which contributed to the increased risk of development of Oral Cancer. However, alcohol consumption and cigarette smoking has a modifying effect in the development of Oral Cancer and males who had one or more of these habits showed more frequent oral changes than females. Thus, insisting a need for appropriate prevention and counselling for patients with deleterious habits at the initial stage to minimize the risk of development of Oral Cancer.

AUTHOR CONTRIBUTIONS: All authors discussed the results and contributed to the final manuscript. H.Firdus Fareen, Deepika Rajendran carried out the experiment. H.Firdus Fareen, Deepika Rajendran wrote the manuscript with support from Sri Rengalakshmi.

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CONFLICT OF INTEREST: There are no conflicts of interest.

REFERENCES:


GRAPHS:
Graph-1: Bar graph representing the distribution of patients with Oral Cancer, according to the different age groups. X-axis represents different age groups and the Y-axis represents the number of patients with Oral Cancer. Oral Cancer was most commonly seen in the age group of patients 51-70 years (46.7% - green colour) and least common in the age group of patients 30-40 years (10% - red colour).
Graph-2: Bar graph representing the distribution of patients with Oral Cancer, according to the gender. X-axis represents gender distribution and the Y-axis represents the number of patients with Oral Cancer. Oral Cancer was most commonly seen among male patients (83.3% - yellow colour) than female patients (16.7% - orange colour).
Graph-3: Bar graph representing the distribution of patients with Oral Cancer, according to the different types of habits. X-axis represents different habits and the Y-axis represents the number of patients with Oral Cancer. Among different types of habits, Oral Cancer was found prevalent among patients who reported the habit of betel quid chewing (70% - maroon colour) than alcohol consumption (16.7% - grey colour) and tobacco smoking habits (13.3% - beige colour).
Graph-4: Bar graph representing distribution of patients with Oral Cancer and habits according to different age groups. The X-axis represents different habits and the Y-axis represents the number of patients with Oral Cancer. Oral Cancer was most commonly seen in patients in the age groups of 41-50 years (47.6% - blue colour) and 51-70 years (47.6% - green colour) and least common in patients in the age group of 30-40 years (4.8% - red colour) and was most prevalent among patients with betel quid chewing habit. There was a clinical difference but no statistically significant difference was seen in patients with Oral Cancer and habits with respect to different age groups. Chi square test was performed. P Value = 0.075 (P>0.05).
Graph-5: Bar graph representing distribution of patients with Oral Cancer and habits according to gender. The X-axis represents different habits and the Y-axis represents the number of patients with Oral Cancer. Oral Cancer was most commonly seen among male patients (76.2% - yellow colour) than female patients (23.8% - orange colour) and was most prevalent among patients with betel quid chewing habit. There was a clinical difference but no statistically significant difference was seen in patients with Oral Cancer and habits with respect to gender. Chi square test was performed. P Value = 0.276 (P>0.05).