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Frequency of Grades of Oral Squamous Cell Carcinoma in Male Tobacco Smokers

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ABSTRACT

Background: Tobacco has over 60 harmful compounds that may enter the body and cause damage. Around 90% of all cases of oral cancer are diagnosed as oral squamous cell carcinoma (OSCC). Tobacco's carcinogenic routes may be complex, as shown by the large body of scientific, clinical, and epidemiological research linking tobacco use to the onset of oral squamous cell carcinoma. **Study Design and Settings:** It was a descriptive cross-sectional study. The study was conducted in the Pathology Department of King Edward Medical University with collaboration of Oncology, Maxillofacial, and Surgical Departments of Mayo Hospital Lahore. Duration of Study: The study was conducted six months after approval of the synopsis, from 16th August 2022 to 15th February 2023. **METHODOLOGY:** It was a descriptive cross-sectional study. Seventy-four patients presenting to oral maxillofacial and surgical departments with oral lesions were biopsied. All biopsies were sent to the Pathology Department of KEMU for processing and reporting. Patients' demographics, duration and frequency of tobacco smoking, histological diagnosis, and grade were noted in a predesigned proforma after taking informed consent. **RESULTS:** In our study, the mean age of patients was 45.57±9.92 years. Duration of smoking was calculated in 63 (85.1%) cases for up to 10 years and 11 (14.9%) had >10 years of smoking. Frequency of grades of oral squamous cell carcinoma in male tobacco smokers shows that 12 (16.2%) cases had grade I, 44 (59.5%) had grade II, and 18 (24.3%) cases had grade III squamous cell carcinoma. **CONCLUSION:** Frequency of grade II was the commonest grade of oral squamous cell carcinoma in male tobacco smokers in our population.

INTRODUCTION

Oral cancer is the sixth most prevalent cancer worldwide.1 South Asia is one of the most prevalent regions for oral cancers 2. Squamous cell carcinoma accounts for more than 90% of oral malignancies 3. The typical presenting age of this carcinoma, reported in Pakistan, is in the 5th–6th decade of life, predominantly affecting males.4 Despite advances in the treatment, oral squamous cell carcinoma has a high recurrence rate and poor prognosis having only 50% survival rate for the first five years.[5]

In developing countries like Pakistan tobacco use is the most common cause of oral cancer with predominantly affecting males.[5] Although onset of Oral Squamous cell carcinoma (OSCC) in young age is thought to be uncommon, the population younger than 40 years is increasingly being affected by OSCC.[6] Non-smoking risk factors for oral squamous cell carcinoma are alcohol, viral infections, pollutants, poor oral hygiene and genetic influences.[7]

It is an established fact that tobacco smoking is one of the main risk factors for OSCC worldwide. [4,7] OSCC is histologically graded as grades I, II and III depending upon differentiation and keratinization considered as independent prognostic factors.

Grade III has the worst prognosis as compared to Grade I and Grade II [8]. Cigarette smoking is another independent factor for advanced (Grade III) Oral squamous cell carcinoma.

A study conducted in 2019 showed that smokers have higher grades of malignancy than non-smokers, however no study showed effect of duration and frequency of smoking on tumor grade[4,9]. In another larger study, 36.8% of smokers had Grade I, 42.5% smokers had Grade II, while 20.7% smokers had Grade III Oral Squamous cell carcinoma.[10]

To the best of our knowledge, there has not been any research carried out in Pakistan that examines the influence that the length of tobacco use and the frequency of tobacco use have on the grades of oral squamous cell carcinoma. It has not, to the best of our knowledge, ever been fully explored if a correlation exists between the frequency and duration of cigarette smoking and the histological grades of oral squamous cell carcinoma (OSCC).

The purpose of this research was to examine whether or not the frequency of smoking and the length of time a person had smoked were predictive of more aggressive clinical characteristics and worse survival outcomes in patients who had OSCC. Counseling cigarette users, devising treatment techniques, and conducting survival analyses will all benefit from this information.

METHODOLOGY

Sample Size: Sample size of 74 patients was estimated by using 95% confidence level, 9% absolute precision with expected percentage of oral squamous cell carcinoma among tobacco users of grade III or 20.7%[10]

Sampling Technique: Non probability consecutive sampling technique was used

Sample Selection

Inclusion Criteria: All excisional/incisional biopsies of oral squamous cell carcinoma were included in the study after taking informed consent only active tobacco smokers were included in the study only male patients were included in the study

Exclusion criteria: Autolysed specimens were excluded. Patients who had been treated with radiotherapy and chemotherapy were excluded.

Data Collection Procedure

It was a descriptive cross sectional study. 74 patients presenting to oral maxillofacial and surgical departments with oral lesions were biopsied. All biopsies were sent to the pathology department of KEMU for processing and reporting. Patient's demographics, duration and frequency of tobacco smoking, histological diagnosis and grade were noted in predesigned proforma after taking informed consent.

Data Analysis Procedure

The data was entered in SPSS 26. Qualitative variables like histopathological grade were presented as frequency and percentages. Quantitative variables like age, duration of smoking, number of cigarettes/day were presented as mean and standard deviation. The data was stratified for age, duration of smoking and number of cigarettes/day. Chi square test was applied. Post stratification considering p-value≤0.05 significant.

RESULTS

A total of 74 cases fulfilling the selection criteria were enrolled to determine the frequency of grades of oral squamous cell carcinoma in male tobacco smokers. Age distribution of the patients was done, it shows that 25(33.9%) cases were up to 40 years of age and 49(66.2%) had >40 years of age, mean age was 45.57±9.92 years. Duration of smoking was calculated in 63(85.1%) cases for up to 10 years and 11(14.9%) had >10 years of smoking. Number of cigarettes was calculated as 26(35.1%) cases for 1-10/day and 48(64.9%) cases had >10/day cigarettes smoking. Frequency of grades of oral squamous cell carcinoma in male tobacco smokers shows that 12(16.2%) cases had grade I, 44(59.5%) had grade II and 18(24.3%) cases had grade III squamous cell carcinoma. The data was stratified for age, duration of smoking and number of cigarettes/day. Chi square test was applied. Post stratification considering p-value≤0.05 as significant.

Table 1

Age (in years)	No. of Patients	%
Up to 40	25	33.8
>40	49	66.2
Total	74	100
Mean ± SD	45.57 ± 9.92	
Duration (In years)	**No. of Patients**	**%**
Up to 10	63	85.1
>10	11	14.9
Total	74	100
Mean ± SD	7.27±2.43	
Number of cigarettes/day	**No. of Patients**	**%**
1-10	26	35.1
>10	48	64.9
Total	74	100
Mean ± SD	12.86±3.96	
Grade of OSCC	**No. of Patients**	**%**
I	12	16.2
II	44	59.5
III	18	24.3
Total	74	100

Table 2

Frequency of Grades of Oral Squamous Cell Carcinoma in Male Tobacco Smokers by Age

Age (Years)	Grade I	Grade II	Grade III
Up to 40	1(8%)	15(60%)	8(32%)
>40	10(20.4%)	29(59.2%)	10(20.4%)

Table 3

Frequency of Grades of Oral Squamous Cell Carcinoma in Male Tobacco Smokers by Duration(years) of Smoking

Duration (Years)	Grade I	Grade II	Grade III
Up to 10	9(14.3%)	37(58.7%)	17(27%)
>10	3(27.3%)	7(63.6%)	1(9.1%)

Table 4

Frequency of Grades of Oral Squamous Cell Carcinoma in Male Tobacco Smokers by no. of Cigarettes/Day

No. of cigarettes/day	Grade I	Grade II	Grade III
Up to 10	5(19.2%)	14(53.8%)	7(26.9%)
>10	7(14.6%)	30(62.5%)	11(22.9%)

DISCUSSION

One of the leading causes of preventable death throughout the world is tobacco use. Tobacco has over 60 harmful compounds that may enter the body and cause damage. Around 90% of all cases of oral cancer are diagnosed as oral squamous cell carcinoma (OSCC). Tobacco's carcinogenic routes may be complex, as shown by the large body of scientific, clinical, and epidemiological research linking tobacco use to the onset of oral squamous cell carcinoma.

The purpose of this research was to examine whether or not the frequency of smoking and the length of time a person has smoked are predictive of more aggressive clinical characteristics and worse survival outcomes in patients who have OSCC. Counseling cigarette users, devising treatment techniques, and conducting survival analyses will all benefit from this information.

In our study, of 74 cases 25(33.9%) cases were up to 40

years of age and 49(66.2%) had >40 years of age, mean age was 45.57±9.92 years, duration of smoking was calculated in 63(85.1%) cases for up to 10 years and 11(14.9%) had >10 years of smoking. The number of cigarettes was calculated as 26(35.1%) cases for 1-10/day and 48(64.9%) cases had >10/day cigarettes smoking. Frequency of grades of oral squamous cell carcinoma in male tobacco smokers shows that 12(16.2%) cases had grade I, 44(59.5%) had grade II and 18(24.3%) cases had grade III squamous cell carcinoma.

A previous study conducted in 2019 showed that smokers have higher grades of malignancy than non-smokers, however no study showed effect of duration and frequency of smoking on tumor grade.[4,9] Our findings are comparable with another larger study, where 36.8% of smokers had Grade 1, 42.5% smokers had Grade II, while 20.7% smokers had Grade III Oral Squamous cell carcinoma.[10] Sajith Tilal Edirisinghe and others[11] aimed to determine the relative risk of OSCC for different tobacco consumption patterns in a selected Sri Lankan population they revealed that the overall risk of OSCC Increased 2.93-fold for smokers. Those smoking two packets of cigarettes or more per day (OR=5.56; 95% CI-2.822-10.984; p=0.000) had more than double the risk of OSCC than those smoking 1-2 packets per day.

Smoking for more than 20 years had a 3.4-fold risk of OSCC. Consumption of betel quid containing tobacco (smokeless tobacco) had a 4.26 fold higher risk for OSCC (OR=4.26; 95% CI-2.21-8.21; p=0.000) and the risk increased when all four Ingredients (betel leaf, slaked lime, areca nut, and tobacco) were consumed together (OR=4.26; 95% CI-2.34-7.74; p=0.000). The combined effect from concurrent smoking and betel chewing emerged as the highest risk for OSCC (OR=15.34) which significantly exceeded the risks evident for the two habits practised in isolation from each other.

According to the most current epidemiology conducted by the OSCC, the prevalence in developing nations, also known as low- and middle-income countries, tends to be greater than that which occurs in developed countries.[12] According to the collected information, the following characteristics are considered to be risk factors for oral squamous cell carcinoma: age, sex, race, gender, nicotine, alcohol, betel nut, food, and nutrition.[13] Tobacco use is by far the most prevalent of these.

A considerable dose-response association between tobacco use and the risk of oral cancer or potentially malignant oral sickness has been demonstrated by a vast number of epidemiological studies. This link has been shown to be proportional to the amount of tobacco used. A study[14] conducted at the beginning of 1994 on 454 patients with oral carcinoma found that sixty percent of those with oral carcinoma smoked and that more than ninety-five percent of neoplasms were squamous cell carcinoma. Additionally, the study found that sixty percent of those with oral carcinoma had a family history of oral carcinoma. In 1999, another study[15] highlighted the role of cigarettes in the evolution of oral epithelial dysplasia (OED) in a significant number of European patients. OED is an oral condition that causes the epithelium of the mouth to become abnormally shaped.

It is estimated that smoking and chewing activities are responsible for over 90% of oral cancer cases that are reported each year in South-East Asia, which results in more than 180,000 cases of the disease being diagnosed each year. Depending on the kind of tobacco product, there are over sixty known or possible carcinogens that may be found in tobacco. These carcinogens have the potential to raise the relative risk of cancer through a variety of different mechanisms. Some of these mechanisms include oxidative stress on tissues, persistent reactive oxygen species, lipids, carbohydrates, and DNA to disrupt cell cycle-regulated mutations, and effects on the immune system.[16] The use of tobacco products is associated with an increased risk of developing lung cancer, mouth cancer, and throat cancer. Tobacco is commonly acknowledged to be one of the most prominent carcinogenic causes of oral squamous cell carcinoma (OSCC), and it is possible that tobacco's carcinogenic pathways include many steps.

CONCLUSION

Frequency of grade II was the commonest grade of oral squamous cell carcinoma in male tobacco smokers in our population.

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