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Assessment of Risk Factors Causing Oral Cancer among Patients Visiting Dental OPD

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ARTICLE INFO

ABSTRACT

In Pakistan, oral cavity cancer incidence rates are increasing making it the most common cancer, numbered as the second cancer in the list of cancers among males as well as females. Oral cancer is diagnosed frequently and is one of the leading causes of death in Pakistan. Worldwide, oral cancer is 6th most common cancer; in developing countries like Pakistan, India, and Sri Lanka incidence is very high. **Objective:** To examine the risk factors causing oral cancer among patients visiting the dental Out Patients Department of Liaquat University of Medical and Health Science, Jamshoro/Hyderabad. **Methods:** A cross-sectional study was done at the Department of Oral and Maxillofacial Surgery Department, Liaquat University of Medical and Health Science, Jamshoro/Hyderabad over a six-month duration. The data were analyzed by using SPSS version 26 employing Pearson's chi-square test. **Results:** Male were mostly affected as compared to female (76%). The mean age of the patients was noted as 46.62 years. Buccal mucosa was the most common site affected (45.5%). Smokeless tobacco products and smoking have a significant association with oral cancer (p-value=0.000). **Conclusions:** It was concluded that smokeless products are used more frequently than smoking and have more risk of increasing the incidence of oral cancer. Among all participants, 115 patients were diagnosed with squamous cell carcinoma.

INTRODUCTION

Oral cancer is well-defined as, the neoplasm of a malignant nature raised in the mouth, lips and anterior two of three equal parts of the whole of the tongue involving the lining mucosa[1]. Globally it is among the most common cancers, almost 300,000 cases are diagnosed yearly, due to very poor prognosis it is a serious global health problem[2]. it is a common cancer number as a sixth of cancer all over the globe. In Pakistan, the frequency rates of cancer of mouth are increasing making it the most common cancer, ranked as the second cancer in the list of cancers among male as

well as female. Oral cancer estimation in the year 2020 was in 16th rank in incidence and global death caused across much of South and Southeast Asia and the Western Pacific [3, 4]. Differences in mortality were seen among countries, developing countries result from more involvement of around two-thirds of the population and in South Asia approximately half[5]. Oral cancer is diagnosed frequently and is one of the leading causes of death in Pakistan. It has a multifactorial etiology. The most common risk factors in Pakistan are: Tobacco in its multiple forms smokeless

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tobacco and smoking [6]. Smokeless tobacco products are substances used without combustion, they contain many toxic products, and nicotine and tobacco-specific nitrosamines are present in them and may lead to many health hazards local as well as systemic [7]. In Pakistan, rates of smokeless tobacco consumption are higher than cigarette use, and oral cancer rates are increasing to the highest, significantly higher than in other countries of the Region. The cause of this increasing habit is the misconception that tobacco products such as smokeless tobacco are less harmful to health than smoking cigarettes, the health dangers of smokeless tobacco use are less understood by users [8, 9]. Two main types of Smokeless tobacco are broadly categorized as: Tobacco in chewing form and snuff, availability of chewing tobacco is commonly in the form of cut, loose and ragged leaves and snuff is available as tobacco that is finely ground packaged in sachets can be dry, moist in consistency. These products are available in the market with different names such as Naswar, Gutka, Betel Quid, Supari, Manipuri, Mawa, Khaini, Qiwam, Zarda, Nass, Mishri, Gul, Shammah plug, Gudakhu, highly reactive electrophiles are released by smokeless tobacco products because nitrosamines are present in them and as a result, free radicals develop oxidative stress [10, 11], damage of DNA, lipid peroxidation level increase and levels of antioxidant enzymes altered are harmful changes produced by the generation of these free radicals [12]. The very initial line of defence against damage by any free radical are these antioxidant enzymes, alterations in their levels affect their function of defence [13]. The common clinical features are unhealing ulcers in the mouth, persistent swellings in the oral cavity, chewing difficulty, limited mouth opening, and swelling to the advanced stages [14]. A complete history of the patient with a history of tobacco use by either means of tobacco, smokeless tobacco or smoking along with Clinical examination and Biopsy are keys for diagnosis for effective planning and promoting cancer awareness programs, prevention and visit programs, it is very critical to have an eye on available information analyzing, investigating the background of top risk factors causing oral cancer in different locations. This study will add to existing knowledge on the major cause of a rise in the incidence of oral cancer in a population of Jamshoro/Hyderabad city, Pakistan.

This study aimed to examine the risk factors causing oral cancer among patients visiting the dental outpatient department of Liaquat University of Medical Health Science, Jamshoro/Hyderabad.

M E T H O D S

A cross-sectional study was conducted at the Department of Oral and Maxillofacial Surgery department Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro/Hyderabad in the time frame of six months (December 2020 to May 2021) by non-probability convenience sampling technique after the approval by Ethical review committee of LUMHS (NO.LUMHS/REC/-974) on dated. The sample size was calculated by Raosoft online calculator using the Margin of error=5%, Confidence interval= 95%, and Response distribution/ Prevalence= 8.6% [3]. The total sample size calculated was 121. Inclusion criteria consisted of patients aged between 20 to 72 years, either gender with a histopathological confirmed diagnosis of oral cancer, a history of tobacco use minimum from 2 years either using consuming smokeless tobacco products or smoking, cases visiting the hospital during the study period, patient having oral cancer with history of smokeless tobacco use or smoking or both of them, patients having history of tobacco smokeless/ smoking were included and patients were not willing to participate in the study, mentally retarded patients and pregnant women were excluded. Data were collected from the patients after getting a signed written informed consent form. Demographic details like age and gender were noted. All information about patients was kept confidential. After complete history and examination, the patients fulfilling inclusion criteria were included in the study. A biopsy procedure was performed for the patients including injection of 2% xylocaine anaesthesia and then tissues were packed in 10% formalin solution for the diagnosis in the histopathological laboratory. Instructions and medication were prescribed after the procedure. The data were analyzed by using the software SPSS version 26.0. The frequency and percentages were calculated for categorical variables like gender, oral hygiene practices, smoking and smokeless tobacco. The mean and standard deviation (SD) was calculated for continuous variables like age. The Pearson's chi-square (χ2) test with the level of significance set as $p<0.05$ was applied to check the statistical significance.

R E S U L T S

Age of patients is divided into groups where the majority of patients belong to age group 31-40 and 41-50 years 37 (30.5%) followed by age group 51-60 years 26 (21.4%), 61-72 years 11 (9.09%) respectively and mean age of patients was 46.62 + 11.35 years. Whereas gender distribution shows that male was in predominance 92 (76%) and female were 29 (24%) as shown in table 1.

Table 1: Demographic Information of Patients

Variables	Frequency (%)
Age	
20-30	10 (8.26%)
31-40	37 (30.5%)

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41-50	37 (30.5%)
51-60	26 (21.4%)
61-72	11 (9.09%)
Gender	
Male	92 (76.0%)
Female	29 (24.0%)

Table 2 demonstrates the stratification of brushing habit, and duration time of smokeless tobacco use. Brushing habit indicates that out of 121 just 1 had brushed in past before acquiring oral cancer, all others admitted that neither they did at the current point time due to oral lesions nor before the lesion, they admitted to never brushing habit. 93 patients (76.9%) used tobacco for more than 20 years, 23 patients (19%) used tobacco for more than 5 years and 5 patients (4.1%) admitted the use of tobacco products for less than 3 years. 46 patients (38%) had use of smoking for 1-5 years while 75 patients (62%) agreed to use smoking for more than 5 years. Regarding the site of complaint lesion which later proved as oral cancer as indicated in this study buccal mucosa was the most common site affected at 45.5% (n=55), 20.7% (n=25) had lesion at retro molar trigon, 18.2% (n=22), complaint the presence of lesion at the lateral border of tongue respectively and the least site documented was the palate 5.8% (n=7) as presented in table 2.

Table 2: Stratification of Brushing Habit, Duration Time of Smokeless Tobacco Use

Variables		Frequency (%)
Brushing Habit	No Brushing Habit	120 (99.2%)
	Daily Brushing	1 (0.8%)
Duration of Smokeless Tobacco Use	More Than 5 Years	23 (19.0%)
	More Than 20 Years	93 (76.9%)
	Less Than 3 Years	5 (4.1%)
Duration of Smoking	1-5 Years	46 (38.0%)
	More Than 5 Years	75 (62.0%)
Site Involved	Retro-molar-trigon	25 (20.6%)
	Buccal Mucosa	55 (45.5%)
	The Lateral Border of the Tongue	22 (18.2%)
	Lip	12 (9.9%)
	Palate	7 (5.8%)

Tobacco type use by patients and the status of biopsy results. The Majority of patients were using smokeless tobacco products 36 patients used Naswar as the most common type followed by 26 patients with complaints of lesions were users of Mainpuri, and 18 patients were habitual of betel nuts respectively. 30 patients were using both smokeless tobacco products as well as smoking and they all were found to have squamous cell carcinoma and results are shown in table 3.

Table 3: Tobacco Type Use by Patients and Status of Biopsy Results

Type of Tobacco Use	Number of Patients	Biopsy Proved Squamous Cell Carcinoma		p-Value
		Yes	**No**	
Smokeless Tobacco				
Mainpuri	26	25	1	
Gutka	3	3	0	
Naswar	36	34	2	
Betal nut	18	17	1	0.000
Pan	3	2	1	
Nas	1	0	1	
Only smoking				
Smokers	4	4	0	
Smokeless Tobacco and Smoking				
Total	30	30	0	
	121	115	6	

DISCUSSION

Oral cancer is a multifactorial disease and one of the most common malignancies globally. Indian studies report that the site of oral cancer is most often found in the tongue and buccal mucosa, among those sites involvement of buccal mucosa, was on top [18]. Another study in Chennai reports that oral cancer is reported to peak at the base of the tongue and mouth with an increased metastasis rate [12]. Another study reports that buccal mucosa, alveolus, and the base of the oral cavity were mostly involved sites [13]. Current study resulted out of 121 patients 45.5% (n=55) had lesions at the buccal mucosa, 20.7% (n=25) patients had lesions at the retro-molar trigone area, 18.2% (n=22) patients given the complaint of the presence of lesion at the lateral border of the tongue, 12 patients had lip lesion, 7 patients sited lesion at the palate. In the present study, it was observed that men were more commonly affected and found habitual of smoking and smokeless products. During the whole study time, none of the Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, or Asexual (LGBTQ) (Transgender persons) patients came with clinical symptoms of oral cancer, this is the point for further research that either they are resistant to the disease or have no habit of ST or it was just a time blink in which they could not approach to hospital for the subjected reason. The World Health Organization (WHO) estimations recorded that about 58% of world oral and oropharyngeal cancer-reporting patients belong to South and Southeast Asia, Indonesia [15]. Education plays a key role in society and self-hygiene maintenance. Developed countries of the World are so self-esthetic conscious and our people are unfortunately very backwards, almost all the patients with oral cancer have a habit of ST consumption too, and reported that they never do tooth brushing. This point should be considered for future developmental plans to ignite more light of awareness and raise educational plans

for future generations. As for disease of oral cancer is observed in people of more anxiety-bearing poor and Labourers, farmers and drivers by occupation, this group of people undergo more physical and mental workload and anxiety thoughts so as anxiety was relevant they use smokeless tobacco, more use of the masticatory system as in bruxism during the night during sleep is seen in anxious people likewise overuse of masticatory system by whole day chewing of smokeless tobacco products can be correlated for future researches. Various surgical groups and treatment guidelines suggest that appropriate treatment can only be selected by appropriate Knowledge of the extent of the disease and it plays a key. Impacts of efforts for early detection, diagnosis, clinical studies which are required for stratification of patients, and appropriate treatment selection require knowledge and information that can be obtained by identifying the anatomic extent, histology of a neoplasm, topography, and Cancer staging [16]. One study suggests diagnosis by nano biosensors, in that proteases, transmembrane receptors, adhesion molecules and tetraspanins are enriched on phosphatidyl serine, cholesterol and ceramide all together compose exosomes. Some proteins that have an association with cancer are also expressed on exosome surfaces in high concentrations that can also be used as differentiation markers among cancers. human epidermal growth factor receptor 2 (HER2), Mucin 18 (MUC18), and Latent Membrane Protein 1 (LMP1) are Proteins that can be used as exosome detectors, these are found in biosensors development for total. A particular nucleic acid, miR-24–3P (miRNA) found in the saliva, is expressed in high amounts in Oral Squamous Cell Carcinoma (OSCC) patients. Based on this, recently, a potential biosensor has been developed that prefers miRNA as a target for the diagnosis of oral cancer [17]. Diagnostics by Nano-biosensors-based lateral flow immune sensing is a revolution in the field of oral cancer early diagnosis [18-20] that needs to be common in Pakistan that until is not as frequent as in other developed countries Pakistan yet needs to work more for enhancement in oral cancer diagnostics at very early stages. Indicates cancer-causing bad habits increase the risk of oral cancer in the community, risky habits include betel nut chewing, alcohol consumption, and smoking, hypothesis is that practicing these may be influencing salivary profiles as well and having a worse impact on oral health [21, 22].

CONCLUSIONS

It was concluded that regarding gender, male was more affected than female, the use of Naswar was found at peak level and the second leading habit was Manipuri. The buccal mucosa was the most commonly involved site. There is a strong association between smokeless tobacco product use and oral cancer. There is a close relationship between poverty, stress and the use of such products, further studies should be conducted to confirm the relationship of such habits.

Authors Contribution

Conceptualization: MM

Methodology: BC, SUUB, MS

Formal analysis: BC, AS, RK

Writing review and editing: MAP, RK

All authors have read and agreed to the published version of the manuscript

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

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