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Original Article

Pattern of Carcinoma of Oral Cavity at a Tertiary Care Center

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ABSTRACT

Objective: To identify the distinct anatomical sites of the oral cavity those are susceptible to the occurrence of cancer among patients visiting a tertiary care hospital in Karachi, Pakistan.

Methods: Around 329 participants were enrolled in this retrospective study which was completed at Jinnah Postgraduate Medical Centre in Karachi, Pakistan from January 2016 to December 2018. The data regarding the occurrence of different types of carcinoma in the oral cavity, site of the lesion along with the degree of differentiation for squamous cell carcinoma was reported in this study.

Results: The participants enrolled in the study were mostly males i.e. 62% and only 38% were females. The mean age of the participants was 40.00 ± 16.84 (SD). Approximately, 179 participants tested positive for cancer while 150 were diagnosed with other conditions of the oral cavity. About 142 cases of squamous cell carcinoma were identified and only 1 case of papillary carcinoma was seen apart from other types of cancers. Most of the lesions were detected in the buccal mucosa (58%) followed by the lips (9%) and tongue (8%).

Conclusion: It is evident from this study that cancer is predominantly seen in the buccal mucosa of the oral cavity with males being more highly susceptible than females.

Keywords: Female, Male, Oral Cancer, Oral Health, Public Health, Squamous Cell Carcinoma.

Introduction

The prevalence of head and neck cancer constitutes as among the top ten malignancies across the globe, with oral cancer being among leading cause of mortality especially in the Indian sub-continent.[1] A number of contributing factors have been associated with the ascending trend of oral carcinoma which fluctuates from country to country and even among different regions within a country, based on their respective cultural settings and living standards, out of which South East Asia exhibits among the top most continents where the highest number of occurrences of the tumors are reported.[2]

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The most important attributable factors that have been identified through past research are the use of tobacco, exposure to radiation, bacterial or viral infections, chronic trauma or any nutritional deficiency or immune deficiency disorders.[3-5]

Histologically there are multiple types and levels of differentiation of oral cancers; Squamous cell carcinoma was identified as the most frequently occurring oral cancer in the South Asian region. Its high prevalence can be directly linked with the use the chewing of betel-quid or different forms of tobacco.[6] A local based study carried out in the district south of Karachi reported the annual incidence of 4.1 per 100000 among males and 4 per 100000 among females.[1] The progressive and invasive nature of oral cancers renders them to transform into malignant lesions at a very higher rate, this in turn leads to the increased potential to metastases surrounding peri-oral tissues or to the regional lymph nodes.[7] The severity of the disease determines the treatment protocols required consequently sometimes leading to disfigurement of facial structures and features and

thus adversely affecting the overall quality of life of the individual.[8]

Among chronic conditions the chances for survival is quite low with the possibility for re-infection being very high and as high costs are concurred during treatment, this further causes an increase in the mortality rates for oral cancer.[7] For charting out the management plan, correct diagnosis are required which include history taking, proper clinical examination and whenever indicated conducting oral biopsies.

A recent retrospective analysis from Pakistan reported that oral cancers were mostly observed in the buccal mucosa (62%) followed by tongue (30%) while the remaining cases of cancers were present on the lips, floor of the mouth, gingiva, cheeks and hard palate.[9] The statistical findings of a five year study conducted between 2010 till 2015 at Bahawalpur Institute of Nuclear Medicine and Oncology (BINO) and the Multan Institute of Nuclear Medicine and Radiotherapy (MINAR) reported that (95%) cases of Squamous cell carcinoma was diagnosed amid 398 oral cancer patients while only 5% suffered from non-Squamous cell carcinoma lesions.[10]

Anatomically the oral cavity is oval shaped; there is a marked differentiation between the oral cavity proper and vestibule. The oral cavity is histologically subdivided into many areas, each site has a different vulnerability levels for different types of cancers. Since location of the lesion has a pivotal part in determining the prognosis of this disease, therefore the prompt identification of the pattern of the lesion will thereby govern the overall wellbeing of the individual. In Western countries the most recurrent anatomical site for oral cancer is tongue. However, estimates derived from studies previously conducted across Pakistan have reported conflicting results.[9-11] Thus, the study is planned to define the distribution pattern of oral cancers based on their appearance at different anatomical regions of the oral cavity affecting patients visiting a public tertiary care hospital JPMC in Karachi, Pakistan.

Objective

To identify the distinct anatomical sites of the oral cavity that is susceptible to the occurrence of cancer among patients visiting a tertiary care hospital in Karachi, Pakistan.

Methodology

A retrospective study design was opted for this study. Data collection was initiated after receiving the approval from the Institutional Review Board (IRB) of Jinnah Post Graduate Medical Centre, Karachi, Sindh Pakistan. The study was conducted from January 2016 to December 2018 and a non – probability consecutive sampling technique was used to enrol the participants.

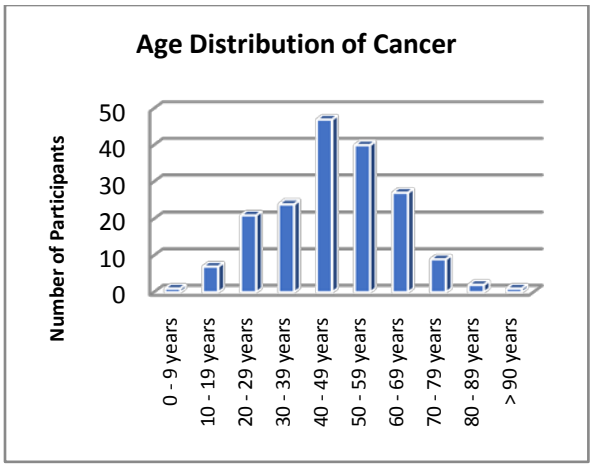
All the patients who satisfied the inclusion and exclusion criteria were selected i.e. participants from either gender, belonging to any age group and those who presented with complaints of ulcer or lesions of the oral cavity and confirmed cases of oral cancer by histopathology and biopsy were included while those who had to be re-examined or provided incomplete/ missing information were excluded from the study. Upon acquiring the informed consent/ assent from the selected participants, a pre-designed descriptive performa with closed ended questions was used to record all the findings.

Information was also collected on the cancer lesion type (i.e. Squamous cell carcinoma, Verrocous carcinoma and Papillary Carcinoma), site of lesion (tongue, buccal mucosa, lips, gingiva, floor of mouth, alveolus, palate and others) and degree of differentiation (well differentiated, moderately differentiated and poorly differentiated).

The collected information was then recorded on Microsoft excel and statistically analyzed using IBM SPSS software version 22. Frequency and percentages was noted for categorical variables while mean and standard deviation was reported for the continuous variables. Graphical representation such as bars and pie charts were used to provide visual representation of the data. Cross tabulation was also performed to compare between different sets of variables.

Results

Collectively, 329 participants were selected over a period of three years for this study, out of which 205 (62%) were males and only 124 (38%) constituted of females. Male to female ratio was 3.2:1. Minimum age among the participants was 5 years while the maximum was 90 years, the mean age was 40.00 ± 16.84 (SD). Approximately172 participants were included during the first 2 years combined and around 157 participants were enrolled during 2018 in this study. Majority of the participants that were diagnosed positive for cancer belonged to the 40 to 49 years age group. (Figure 1).



Among the cancer diagnosed participants142 (43.16%) had squamous cell carcinoma, 19 (5.78%) had verrocous carcinoma and only 1 (0.30%) had papillary carcinoma apart from other cancers of the oral cavity. Non – cancerous findings that were also observed in the study were dysplastic and hyperplastic epithelium, fibro – epithelial polyps, mucocele, chronic granulomatous inflammation, giant cell epulis, ulcero inflammatory lesions and pyogenic granuloma. (Table 1)

Table 1: **Baseline Characteristics of Participants**

Variables	*n = 329 (%)*
Age	
Mean (SD)	40.00 (16.84)
Gender	
Male	205 (62.31)
Female	124 (37.69)
Year of Enrolment of Participants	
2016	86 (26.14)
2017	86 (26.14)
2018	157 (47.72)
Type of Lesion	
Squamous Cell Carcinoma	142 (43.16)
Verrocous Carcinoma	19 (5.78)
Papillary Carcinoma	1 (0.30)
Ameloblastoma	4 (1.22)
Pleomorphic Adenoma	9 (2.74)
Fibroma	2 (0.61)
Spindle Cell Lesion	2 (0.61)
Non – Cancerous Findings	150 (45.59)
Site of the Lesion	
Buccal Mucosa	191 (58.05)
Tongue	26 (7.90)
Lips	29 (8.81)
Gingiva	23 (6.99)
Floor of the mouth	8 (2.43)
Alveolus	10 (3.04)
Palate	5 (1.52)
Mandible	18 (5.47)
Others	19 (5.78)

The commonest site for the lesions was the buccal mucosa 191 (58.05%), followed by lips 29 (8.81%) and tongue 26 (7.90).Excluding the areas of the oral cavity other locations where the lesions were seen included cervical lymph node, maxilla, zygomatic arch, neck, parotid, sub – mandibular and salivary gland. (Table 1)

In this study it was evident that the most recurring type of cancer was squamous cell carcinoma followed by verrocous carcinoma in the buccal mucosa. (Figure 2)

In our study upon cross tabulation between the histological differentiation and gender it was apparent that squamous cell carcinoma was most frequently seen among males as compared to females. (Figure 3)

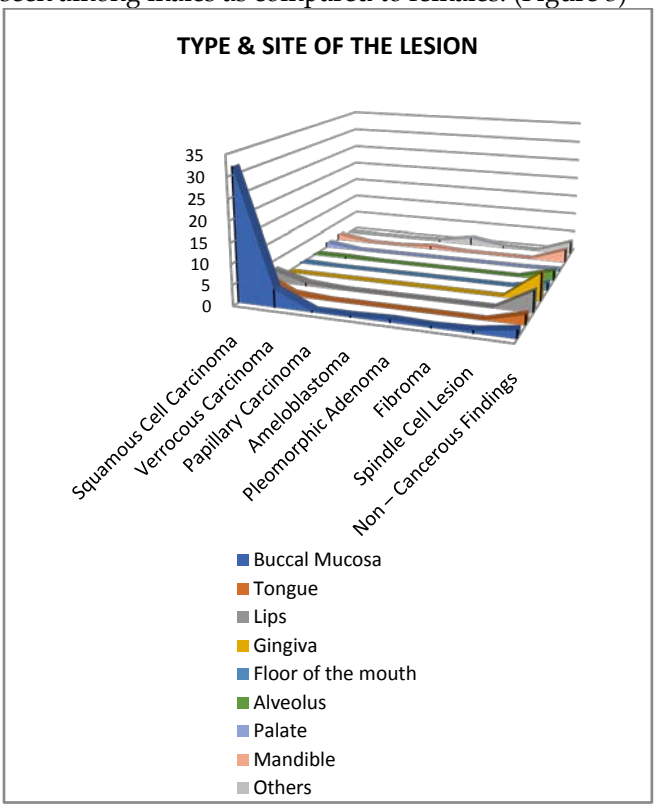


Figure 2: **Comparison of the Type of Lesion Based on Anatomical Position**

Well differentiated was predominantly seen i.e. 79 (24.01%) followed by 57 (17.33%) moderately differentiated and only 6 (1.82%) poorly differentiated among the oral squamous cell carcinoma. Out of the 98 cancerous male patients 54 had well differentiated, 39 had moderately and 5 had poorly differentiated oral squamous cell carcinoma. While in 44 females 25 had well differentiated, 18 had moderately and 1 had poorly differentiated oral squamous cell carcinoma.

In our study upon cross tabulation between the histological differentiation and gender it was apparent that squamous cell carcinoma was most frequently seen among males as compared to females. (Figure 3)

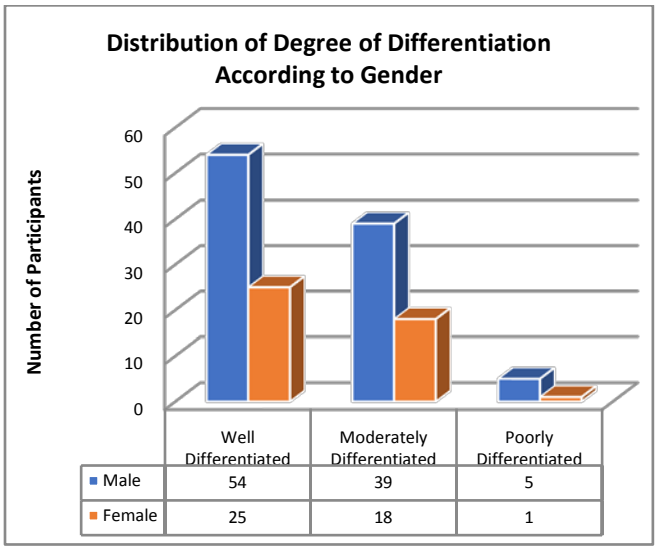


Figure 3: **Comparison of Degree of Differentiation according to Gender**

Discussion

According to an issue of the American Institute for Cancer Research published in 2018 Papua New Guinea rank the highest for oral cavity and lip cancer followed closely by Pakistan.[12]

There are many studies published worldwide regarding the pattern of oral cancer which are coherent with our findings.

Over time it has been statistically proven that men are more susceptible to different types of oral cancers as compared to females. We observed the same findings in our study where more than half of the participants i.e. among the 179 cases that were tested positive for oral carcinoma, 81 were males and only 41 were females. This is similar to a cross sectional study conducted in India in 2018 that assessed the prevalence of oral cancer over a period of 5 years, it was seen that oral cancer was detected more among males as compared to females.[13]

Our study also exhibited similar results in terms of middle aged population being affected the most with oral lesions as compared to the younger or older age groups. This coincides with a previous study in India where oral cancer was more commonly seen among ages between 40 to 50 years. This finding can be related to increased consumptions of cancerous substances such as smoking or chewing of betel quid and areca among the middle age group population.[14]

Another important aspect that was highlighted in our study was the anatomical location and type of the carcinoma. In USA the most affected site for oral cancer is the tongue.[15] similar findings was seen in a 10 year retrospective study, among Italian population in which 99.3% of the participants had of squamous cell carcinoma of the lips.[16]

However, in South-East Asia the most common site that has been strongly associated with oral cancer is the buccal mucosa.[17] comparable results were seen in our data i.e. only 7% had cancers on the lip, 10% on the tongue and 70% had cancer on the buccal mucosa apart from other areas of the oral cavity such as floor of the mouth, palate, mandible and alveolus.

As oral cancer in the buccal mucosa tends to be more progressive and invasive in nature it has a greater chance of recurrence as compared to cancers in other areas of the oral cavity. Therefore, it requires prompt diagnosis and treatment during its early stages.[18]

Approximately 79.32% of the biopsy cases in our study constituted of squamous cell carcinoma, 10.6% cases of verrocous and only 1% case of papillary carcinoma. A local study depicted similar results in which squamous cell carcinoma was the most frequently occurring type of lesion along with almost equal number of both verrocous and papillary carcinoma i.e. less than 6% each. [19]

The pre dominance of oral squamous cell carcinoma has been emphasized upon in many studies. It is directly related to the lifestyle, educational level and socio-economical status of an individual. [20, 21]

It is therefore concluded that many causative agents have been proven to be related to the development of oral cancer. Studies both conducted nationally and internationally have shown that not only gender and age have a direct influence on the occurrence and severity of oral lesions but also social upbringing have a huge impact on the increasing number of cases of oral carcinoma.

It is of great importance that this issue needs to be addressed upon on urgent basis through political and social media campaigns to bring about awareness and change the attitude of individuals in health seeking behavior and reinforce time and time again regarding the life threatening consequences due to the consumption of hazardous substances.

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References

1. Bhurgri Y, Rahim A, Bhutto K, Bhurgri A, Panjanl PK, et al. Incidence of carcinoma of the oral cavity in Karachi district south. J Pak Med Assoc 1998; 48(11):321-25.
2. Mehta FS, Aghi MB, Gupta PC, Pindborg JJ. An intervention study of oral cancer and pre cancer in rural Indian population. Bull WHO 1982;60:441-6.
3. Jafarey NA, Zaidi SHM. Cancer in Pakistan. J Pak Med Assoc 1987;37:178-83.
4. Flaitz CM, Nichols CM, Alder-storthz K, Hicks MJ.Intra oral squamous cell carcinoma in human immunodeficiency virus infection. Oral Surg Oral Med Oral Pathol1996;80:55-62.
5. Kumar M, Nanavati R, Modi TG, Dobariya C. Oral cancer: Etiology and risk factors: A review. J Can Res Therap. 2016;12(2):458-63.
6. Hanif M, Zaidi P, Kamal S, Hameed A. Institution-based cancer incidence in a local population in Pakistan: nine year data analysis. Asian Pacific J Cancer Prev2009; 10:227-30.
7. Rao SVK, Mejia G, Roberts-Thomson K, Logan R. Epidemiology of oral cancer in Asia in the past decade: an update (2000-2012). Asian Pacific J Cancer Prev 2013; 14:5567-77.
8. Lee CC, Chien SH, Hung SK, Yang WZ, Su YC. Effect of individual, neighbourhood socioeconomic status on oral cancer survival. Oral Oncol 2012; 48:253-61.
9. Khan TZ, Ahmed Z, Junaid T. Prevalence of oral cavity cancer according to anatomical sites in Karachi, Pakistan. Rawal Medical Journal. 2016;41(4):450-3.
10. Baig MS, Bhutto RA, Muhammad S, Siddiqui MI. Epidemiology of oral cancer in Southern Punjab, Pakistan. Pak J Med Heal Sci2015;9:1269-71.
11. Riaz F, Nazir HA, Tariq H, Sohail H, Khattak SG, Ali H. Risk factors of oral cancer in Lahore, Pakistan: A case control design. Proceeding SZPGMI 2015;29(1):47-54.
12. American Institute for Cancer Research [Online] Available from: http://www.wcrf.org/dietandcancer/cancer-trend/mouth-pharynx-larynx-cancer-statistics. [Accessed 2 March 2020]
13. Ajay PR, Ashwinirani SR, Nayak A, Suragimath G, Kamala KA, Sande A, Naik RS. Oral cancer prevalence in Western population of Maharashtra, India, for a period of 5 years. Journal of Oral Research and Review. 2018 Jan 1;10(1):11.
14. Basavarajappa D, Kamath R, Shetty B, Mayya S. Patterns of Cancer at a Tertiary Care Hospital in Karnataka-India. Madridge J Cancer Stud Res. 2018 Sep 21;2(1):70-2.
15. Del Corso G, Villa A, Tarsitano A, Gohel A. Current trends in oral cancer: A review. Can Cell Microenviron. 2016;3:e1332.
16. Maruccia M, Onesti MG, Parisi P, Cigna E, Troccola A, Scuderi N. Lip cancer: a 10-year retrospective epidemiological study. Anticancer research. 2012 Apr 1;32(4):1543-6.
17. Harish SG, Anand V. Clinical and histopathological study of oral cancers in a tertiary care hospital, Tumakuru. Indian Journal of Pathology and Oncology. 2017 Jul;4(3):430-3.
18. Kim IH, Myoung H. Squamous cell carcinoma of the buccal mucosa involving the masticator space: a case report. Journal of the Korean Association of Oral and Maxilloacial Surgeons. 2017 Jun 1;43(3):191-6.
19. Sahaf R, Naseem N, Anjum R, Nagi A. Oral Squamous Cell Carcinoma: A clinicopathological Study. Pakistan Oral & Dental Journal. 2017 Mar 31;37(1).
20. Scully C, Bagan J. Oral squamous cell carcinoma: overview of current understanding of aetiopathogenesis and clinical implications. Oral Dis 2009; 15:388-399.
21. Saeed S, Khan JA, Iqbal N, Irfan S, Shafique A, Awan S. Cancer and how patients see it; prevalence and perception of risk factors: a cross-sectional survey from a tertiary care centre of Karachi, Pakistan. BMC public health. 2019 Dec 1;19(1):360.

CONTRIBUTION OF AUTHORS:

- HumeraAkhlaq: Substantial contributions to the conception, study designing; the acquisition, analysis, and interpretation of data and manuscript writing.
- HumeraAkhlaq, Humera Shehzad, Atif Iqbal: Drafting the work or revising it critically for important intellectual content.
- HumeraAkhlaq, Nosheen Mehmood, Mohid Abrar Lone, Muhammad Saad Sheikh: participated in data interpretation and discussion.