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Original Article

Evaluation of Site and Location of Oral Squamous Cell Carcinoma among Patients Visiting at Tertiary Care Hospital Hyderabad

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ABSTRACT

Background: Oral Squamous Cell Carcinoma (OSCC), a prevalent form of oral cancer, is marked by its aggressive nature and potential for metastasis. With a global five-year survival rate below 50%, the incidence of OSCC presents a significant public health challenge. The highest incidence rates are observed in Southeast Asia, correlating with the cultural practices of betel-quid and tobacco consumption.

Objective: To evaluate the common sites and locations of OSCC among patients attending a tertiary care hospital in Hyderabad, with a view to identifying patterns that may guide early detection and targeted interventions.

Methods: This cross-sectional study included 100 clinically diagnosed OSCC patients from Liaquat Medical University Hospital, Hyderabad, from January 2021 to February 2022. Following informed consent, detailed patient examinations were performed. Data on demographic variables, habits, and lesion sites and locations were collected using a structured proforma and analyzed using SPSS Version 25. The study adhered to the ethical guidelines of the Declaration of Helsinki.

Results: The patient cohort exhibited a male predominance (77%) with a mean age of 44.28 ± 13.065 years. Betel Nut (47%) and Gutka (27%) were the most common habits among the patients. The tongue was the most frequently involved site (38%), followed by buccal/labial mucosa (27%) and gingiva (10%). OSCC was more commonly found in the maxilla (75%) than in the mandible (43%).

Conclusion: The results indicate a higher occurrence of OSCC in the maxilla with the tongue being the most common site of manifestation. These findings underscore the need for targeted educational and preventive strategies at the primary healthcare level, emphasizing early diagnosis and intervention.

Keywords: Oral Squamous Cell Carcinoma, OSCC, Betel Nut, Gutka, Epidemiology, Oral Cancer Screening, Maxilla, Tongue Cancer, Tertiary Care Hospital, Hyderabad.

INTRODUCTION

Cancer remains a leading cause of mortality worldwide, occupying the first and second rank in developed and developing countries, respectively (1). Among the myriad forms of cancer, Oral Squamous Cell Carcinoma (OSCC), commonly referred to as oral cancer, is of significant concern. This malignancy, characterized by tumors in the oral cavity, pharynx, and larynx, poses a substantial risk of morbidity and mortality if not adequately addressed. Despite advancements in medical science, the five-year survival rate for OSCC patients is dismally below 50% (2), underlining the severity of the condition. Oral cancers represent around 6% of all cancer cases globally, leading to 650,000 new diagnoses and 350,000 deaths annually (3,4). Particularly high incidences of oral cancer are noted in Southeast Asia and certain regions of southern and central Europe (5,6), indicating geographical variations in prevalence (6).

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Pakistan, like other developing nations, grapples with the dual challenge of infectious diseases and escalating chronic conditions, including oral cancer (OC). Ranked as the fifth most common malignancy worldwide, OC's impact on public health, in terms of morbidity and mortality, is profound (7). The dominant form of OC in Southeast Asia, including Pakistan, is squamous cell carcinoma. This prevalence is attributed to the cultural practices involving betel-quid and various tobacco forms, which significantly increase the risk of malignancy in the oral mucosa (8).

The anatomical complexity of OC is noteworthy, given the interconnected nature of oral and oropharyngeal structures. Historically, carcinomas of the oral cavity and oropharynx were collectively classified as OSCCs, a categorization that has evolved with advances in clinical and translational research. These studies have enabled a clearer differentiation between the two, noting that oropharyngeal tumors typically affect the base of the tongue, palatine tonsils, soft palate, and adenoids (11). In contrast, OC originates from the lip's vermillion border and extends to various oral cavity regions, including the alveolar ridge, gums, anterior two-thirds of the tongue, floor of the mouth, buccal mucosa, retromolar trigone, and hard palate (12). Among OSCC sites, the tongue and buccal cavity are predominantly affected, with lip and palate cancers also observed (9). The risk factors for OSCC are diverse, varying by geographic location, and include smoking, alcohol consumption, distinct chewing habits, and high-risk human papillomavirus (HPV) infections. Notably, in Pakistan, lip and OC collectively represent the second most common cancer type when considering both genders (11%), and the most prevalent among males, accounting for 16% of new cases (7).

The incidence of OC varies across different populations and geographical areas, influenced by ethnicity, age, exposure nature, and genetic predispositions (13). Western societies report a 50% prevalence of tongue and floor of the mouth cancers, whereas cancers of the palate, gums, and buccal/labial mucosa are less common (14). Risk factors for developing OC include tobacco use, smokeless tobacco varieties like naswar, poor oral hygiene, alcohol consumption, and HPV (15,16). In Pakistan, smokeless tobacco in the forms of naswar, betel leaf (paan), and areca nut (gutka) is widely used (17), with a study from Lahore indicating that lip and oral cavity cancers rank as the second most prevalent, fueled by addictions to smoking, alcohol, naswar, and paan (18).

Given the absence of recent OSCC data, this study aims to critically evaluate the most common sites and locations of OSCC among patients attending a tertiary care hospital in Hyderabad. This endeavor is pivotal for understanding OSCC's epidemiological trends within the region, informing both clinical practices and public health strategies.

MATERIAL AND METHODS

In this cross-sectional study, a comprehensive evaluation was undertaken to identify the most prevalent sites and locations of Oral Squamous Cell Carcinoma (OSCC) among patients. The investigation was conducted over a period from January 2021 to February 2022 at Liaquat Medical University Hospital, Hyderabad. A total of 100 clinically diagnosed OSCC cases were meticulously selected for the study, ensuring a diverse representation of both genders and all age groups. The selection criteria hinged on a confirmed diagnosis of OSCC at the Liaquat Medical University Hospital, Hyderabad. Individuals who opted not to provide informed consent were respectfully excluded from the study cohort (9).

Prior to commencement, each participant was required to sign an informed consent form, in accordance with ethical guidelines. The study design and execution adhered strictly to the principles outlined in the Declaration of Helsinki, ensuring the ethical treatment of all participants involved. Detailed examinations were conducted on each participant, focusing on the demographic data, as well as the specific site and location of the OSCC lesions. For the purpose of this study, the sites were categorized into the following: lip, tongue, floor of the mouth, gingiva, alveolar mucosa, palate, and buccal/labial mucosa. The location of these lesions was further classified according to their occurrence in either the maxilla or the mandible (12).

Data was meticulously recorded on a specially designed proforma, tailored to capture the nuanced details required for a comprehensive analysis. Following the data collection phase, a thorough analysis was performed using the Statistical Package for the Social Sciences (SPSS), Version 25.0. This analysis employed simple descriptive statistics to distill the collected data into understandable findings. The approach included calculating frequencies and percentages for categorical variables, while mean and standard deviation were computed for continuous variables (13).

RESULTS

In the cross-sectional study examining the prevalence and characteristics of Oral Squamous Cell Carcinoma (OSCC) among patients, distinct patterns emerged regarding demographic variables and lifestyle habits. The gender distribution among the diagnosed cases revealed a male predominance, with males accounting for 77% of the cases, while females represented 23% (Figure 1). This substantial difference underscores the potential influence of gender-specific risk factors in the etiology of OSCC.

A closer look at the age statistics of the study population showed that the ages of OSCC patients ranged from 18 to 67 years. The average age at diagnosis was 44.28 years, with a standard deviation of 13.065 years, indicating a moderate spread around the mean

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age (Figure 2). This mean age suggests that OSCC is largely a middle-aged disease, but it does not exclude its occurrence in the younger or older population.

Table 1: Descriptive Statistics of Gender

Gender	Frequency	Percent
Male	77	77.0%
Female	23	23.0%
Total	100	100.0%

Table 2: Descriptive Statistics of Age

	N	Minimum	Maximum	Mean	Std. Deviation
Age	100	18	67	44.28	13.065

Table 3: Descriptive Statistics of Habits

Habits	Frequency	Percent
Pan	16	16.0%
Betel Nut	47	47.0%
Gutka	27	27.0%
Naswar	10	10.0%
Total	100	100.0%

Turning to lifestyle habits, which are closely linked to the risk of developing OSCC, the study categorized habits into four major groups: Pan, Betel Nut, Gutka, and Naswar. The use of Betel Nut was the most prevalent habit, recorded in 47% of the cases, followed by Gutka at 27%. Pan users constituted 16%, while the consumption of Naswar was the least common habit among the patients, making up 10% of the cases (Figure 3). These figures highlight the significant role of these substances as risk factors in the etiology of OSCC in the studied population.

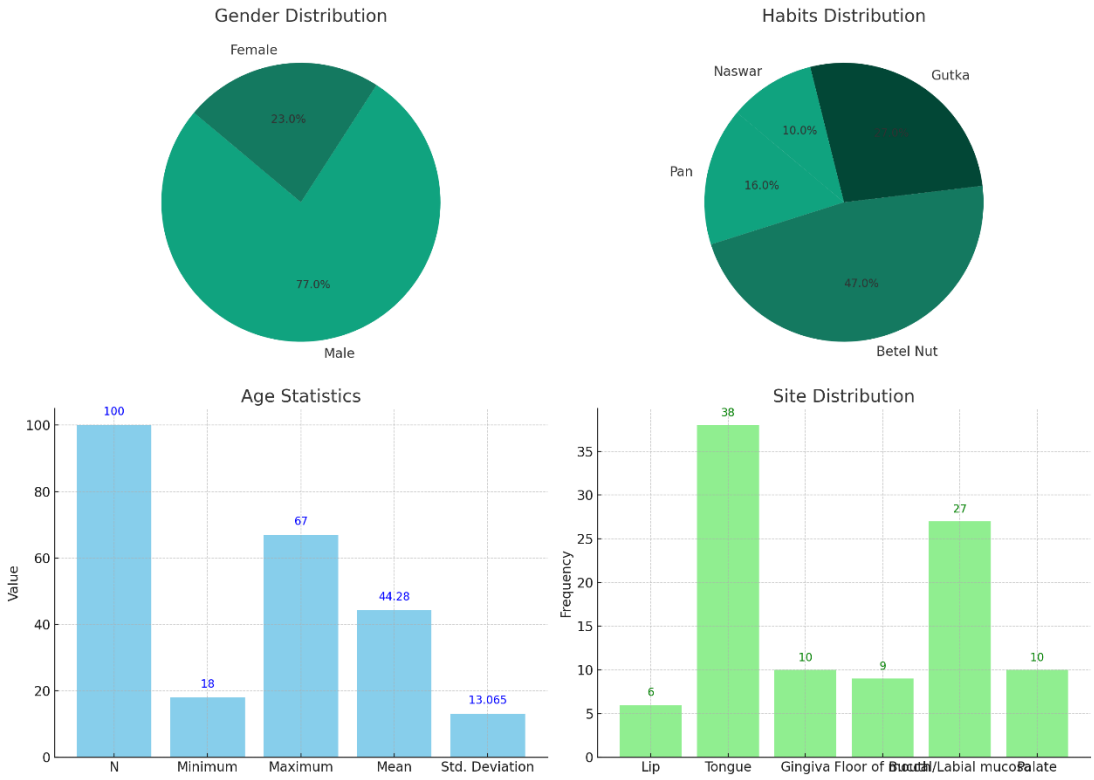

Figure 1 Demographic and Study Characteristics

The distribution of OSCC across various oral sites was another focus of the study. The tongue was identified as the most common site, with 38% of the cases manifesting there, followed by the buccal/labial mucosa, which accounted for 27%. The incidence in other sites, such as the lip, gingiva, floor of the mouth, and palate, was relatively lower, with each site accounting for 6%, 10%, 9%, and 10% of the cases, respectively (Figure 4). The preference for the tongue and buccal/labial mucosa may reflect the patterns of exposure to the risk factors prevalent in the study region.

The study's findings from the tables and figures (Figures 1-4) provide a detailed epidemiological insight into OSCC within the population attending a tertiary care hospital in Hyderabad. These results underscore the importance of focusing on gender differences, age-related risks, and the impact of specific habits like Betel Nut and Gutka consumption, which are prominent in this region. Additionally, the high frequency of cases affecting the tongue necessitates targeted public health strategies for early detection and prevention in these high-risk anatomical locations.

DISCUSSION

Oral squamous cell carcinoma (OSCC) is recognized for its aggressive nature, often exhibiting a high potential for metastasis to regional lymph nodes and adjacent perioral tissues due to its invasive characteristics (19.8). Accounting for approximately 90% of all oral malignancies, the epithelial and mucosal forms of OSCC present a significant oncological challenge (20).

Traditionally, oral cancer has been associated with an older demographic, typically affecting individuals aged between 50 to 70 years. However, emerging literature suggests that OSCC can manifest in younger populations without the presence of traditional risk factors (21). The current study reported a mean age of 44.28 ± 13.06 years among OSCC patients, indicating a shift in the age spectrum of the disease. This is in contrast to global data, which tends to place the mean age between 51-55 years across diverse sociodemographic backgrounds. Notably, a proportion of cases—about 17%—are now being identified in individuals under 40 years of age, a trend that could be reflective of advancements in diagnostic technologies and screening modalities (20).

This study highlighted a gender disparity in the incidence of OSCC, with a greater prevalence observed in males compared to females. This observation is consistent with findings from other regions, such as Japan and Pakistan, where the male-to-female ratio is approximately 1.45 and 1.5, respectively (22). The higher incidence in males may be attributable to greater exposure to known risk factors, such as smokeless tobacco products and alcohol, exacerbated perhaps by more access to markets and socioeconomic pressures that might lead to higher consumption rates of these substances (21).

Risk factors for OSCC appear to be consistent across Asian countries, predominantly involving tobacco consumption in various forms—including quid chewing, smoking, and smokeless options such as naswar and badi—as well as alcohol use (23). The cultural practice of quid chewing is notably prevalent in Pakistan (24), with modern and readily available forms like gutkha and paan masala gaining popularity among all demographics, including children (25,26). The findings of this study corroborate those of Anwar N (27), indicating that betel quid use is the most common habit, followed closely by gutkha consumption.

The anatomical location of OSCC also presented a point of interest. The current analysis found that OSCC predominantly occurred in the maxilla (75%) over the mandible (43%), a distribution that contradicts findings from Shenoi R et al. (28), who reported the mandibular alveolus as the more frequently affected site. The constant contact of the alveolar mucosa, gingiva, and buccal mucosa with carcinogens could be a factor influencing site predilection.

The predilection for OSCC to develop at certain sites within the oral cavity has been observed to vary across different populations and geographical locations, with factors such as ethnicity, age, exposure, and genetics playing roles in this variation (29). In the present study, the tongue emerged as the most affected site (38%), followed by the buccal/labial mucosa (27%) and gingiva (10%). These findings align with research conducted in Punjab, where OSCC of the tongue represented a significant portion of cases (50%) (31). In Western populations, the high incidence of tongue OSCC is often linked to excessive smoking and alcohol consumption (32).

The need for a country-level oral cancer surveillance system is apparent, alongside integrated interventional programs that address oral cancer prevention as part of a national strategy. This approach should involve oral healthcare professionals trained in the early detection, diagnosis, and management of oral cancer.

CONCLUSION

In conclusion, the current study observed a higher occurrence of OSCC in the maxilla with the tongue being the most common site, followed by the buccal/labial mucosa and gingiva. These findings suggest an urgent need for enhanced training at the primary healthcare level to support early diagnosis through soft tissue examinations and biopsies, efficient referral systems, meticulous record-keeping, and improved communication with specialists and oncologists through a comprehensive health management information system.

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