

# Exploration of Oral Cancer in a Tertiary Care Hospital: A Cross Sectional Study

KM Reza-UL-Haq<sup>1</sup>, Mohammed Yousuf<sup>1</sup>, Refat Tabassum<sup>2</sup> and Richmond Ronald Gomes<sup>3,\*</sup>

<sup>1</sup>Department of ENT& Head-Neck Surgery, Delta Medical College, Dhaka, Bangladesh

<sup>2</sup>Department of Biochemistry, Basundhara Ad-din Medical College Hospital, Dhaka, Bangladesh

<sup>3</sup>Department of Medicine, Ad-din Women's Medical College Hospital, Dhaka, Bangladesh

\***Corresponding Author:** Richmond Ronald Gomes, Professor, Dept of Medicine, Ad-din Women's Medical College Hospital, Dhaka, Tel: 8801819289499, E-mail: rrichi.dmc.k56@gmail.com

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## Abstract

**Background:** Oral cancer, a malignancy that manifests in the oral cavity, poses a significant health challenge globally. With its intricate interplay of genetic, environmental, and lifestyle factors, oral cancer has become a prevalent concern, demanding in-depth exploration and analysis. **Objective:** This study aims to assess the oral cancer in a tertiary care hospital setting. **Methods:** A prospective cross-sectional descriptive study was conducted in Delta Medical College & Hospital, Mirpur, Dhaka from July 2016 to June 2023. A total of 489 patients with histopathologically confirmed oral squamous cell carcinoma (OSCC) were enrolled through enumerative sampling. Patients with metastatic, previously treated, recurrent, or multiple/bilateral oral cancer were excluded. Data on demographics, risk factors, site, grades, and TNM stages were collected using a standardized data collection sheet. Statistical Package for the Social Sciences (SPSS) Version 25.0 was employed for data analysis. **Results:** The study included 489 patients with a mean age of  $51.92 \pm 8.55$  years. Males showed a higher susceptibility, constituting 77.9%. The most common site for oral cancer was the tongue (59.5%), followed by the gingival buccal sulcus (23.9%). Other sites included the retromolar area (5.7%), buccal mucosa (3.1%), and lower alveolus (1.6%). Squamous cell carcinoma (SCC) was the predominant histological type, accounting for 96.1% of cases. Most cases were classified as Grade I (71.4%) and majority of patients were diagnosed at Stage III (65.6%). **Conclusion:** These findings underscore the importance of continued efforts in oral cancer prevention, early detection, and targeted interventions, particularly considering the high prevalence among males and the common occurrence on the tongue. Moreover, the predominance of SCC suggests a need for research and interventions focused on this specific histological type. The findings contribute to a comprehensive understanding of oral squamous cell carcinoma (OSCC) in the context of a tertiary care hospital, guiding future research and healthcare initiatives.

**Keywords:** Oral Cancer; Malignancy; Squamous Cell Carcinoma; Buccal Mucosa; Tongue

## Introduction

Oral cancer encompasses malignancies affecting the lips, tongue, oral cavity, oropharynx, hypopharynx, and pyriform sinus [1-3]. It ranks as the sixth most prevalent cancer globally, with over 50,000 annual diagnoses and approximately 30,000 fatalities [1,4,5]. The highest incidence is observed in the south Asian population [6]. Squamous cell carcinoma (SCC) constitutes 85% to 95% of all oral cancer cases, although various other malignant lesions, such as sarcoma, minor salivary gland tumors, mucosal melanoma, lymphoma, or metastatic disease from diverse body sites, can also occur within the oral cavity [1,2,7].

In Bangladesh, over 7,000 new cases are identified annually, with a mortality rate of approximately 6.6% [1,8]. Cancer stands as the sixth primary cause of death in the country, as reported by the Bangladesh Bureau of Statistics. The International Agency for Research on Cancer (IARC) indicated a cancer-related mortality rate of 7.5% in 2005, projected to rise to 13% by 2030. Oral cancer is the second leading cancer in males and the third in females in Bangladesh [1,6,9]. The elderly population, aged over 50, is commonly affected [10] but there is a noticeable increase in the incidence of oral cancer among young females under 45 years old [8,11].

The origin of oral cancer involves various factors, with smoking and alcohol consumption being the primary established risk factors. Other recognized risks include tobacco chewing, snuff dipping, the use of betel quid with tobacco, sunlight and radiation exposure, viruses (human papillomavirus and Epstein-Barr virus), immune deficiency, dental factors, and ethnicity [11-15]. Early detection of oral cavity cancer ensures effective prevention and cure. Unfortunately, a significant number of patients receive a diagnosis only in the later stages, with a survival rate of only 50% after five years [5]. Surgical resection is the preferred treatment for oral squamous cell carcinoma (OSCC), and in cases of locally advanced cancers, adjuvant radiation  $\pm$  chemotherapy is applied for specific purposes [15,16]. Achieving better outcomes necessitates the involvement of a multidisciplinary team [17]. The aim of this study was to evaluate current oral squamous cell cancer.

## Materials and Methods

This prospective cross-sectional descriptive study was conducted on patients attending in Delta Medical College & hospital, Mirpur, Dhaka, from July 2016 to June 2023. A total of 489 patients were selected through enumerative sampling, confirmed histopathologically with oral squamous cell carcinoma via biopsy. All participants had primary oral cancer at a single, unilateral site and had not received prior treatment. Patients with metastatic, previously treated, recurrent, or multiple site/bilateral oral cancer were excluded. Informed consent was obtained, and ethical clearance was secured from the relevant institutional review committee before the study. The objective of the research was to assess the current demographics of oral squamous cell cancer, including risk factors, site, grades, and TNM (Tumor, Node, Metastasis) stages. Data were collected using a standardized sheet, and Statistical Package for the Social Sciences (SPSS) Version 25.0 was utilized for data summarization and analysis.

## Results

This study shows the majority of participants in the study were in the age range of 45-54 years, comprising 52.4% of the total population. Higher prevalence in males (77.9%) compared to females (22.1%) (Table 1). The tongue was identified as the most common site of oral cancer, accounting for 59.5% of cases. Other notable sites include the gingival buccal sulcus (23.9%) and the lip & palate (5.7%) (Table 2). Squamous Cell Carcinoma (SCC) emerged as the predominant histological type, constituting 96.1% of cases (Table 3). The majority of patients presented with Grade I squamous cell carcinoma (71.4%). A significant percentage of Grade II cases (23.9%) suggests a moderate level of differentiation, while Grade III (3.5%) and Grade IV (1.2%) cases indicate poorer differentiation (Table 4). Stage III oral cancer was the most frequently observed (65.6%) and Stage II cases (22.9%) (Table 5).

**Table 1:** Demographic characteristics of the study subject (n=489)

Characteristics	Frequency	Percentage (%)
Age in years		
35-44	72	14.7
45-54	256	52.4
55-64	99	20.2
>64	62	12.7
Mean±SD	51.92±8.55	
Sex		
Male	381	77.9
Female	108	22.1

**Table 2:** Site of cancer of the study subject (n=489)

Site	Frequency	Percentage (%)
Tongue	291	59.5
Gingival buccal sulcus	117	23.9
Retromolar area	28	5.7
Buccal mucosa	15	3.1
Lower alveolus	8	1.6
Li & palate	28	5.7
Others	2	0.4

**Table 3:** Histological type of the study subject (n=489)

Histological type	Frequency	Percentage (%)
SCC	470	96.1
Verrucous Ca	7	1.4
BCC	4	0.8
Adenoid Cystic Ca.	3	0.6
Melanoma	2	0.4
Mucoepidermoid Carcinoma	1	0.2
Spindle Cell Carcinoma	2	0.4

**Table 4:** Grading of the study subject (n=489)

Grading	Frequency	Percent
Grade I	349	71.4
Grade II	117	23.9
Grade III	17	3.5
Grade IV	6	1.2

**Table 5:** Staging of the study subject (n=489)

Grading	Frequency	Percent
Stage I	17	3.5
Stage II	112	22.9
Stage III	321	65.6
Stage IVA	20	4.1
Stage IVB	13	2.7
Stage IVC	6	1.2

## Discussion

Oral cancer (OC) is an uncommon malignancy being one of the most common cancers in some high-risk areas of the world. It is a largely preventable cancer, since most of the different risk factors identified, such as tobacco use, alcohol consumption, and betel nut chewing, are behaviors that increase the likelihood of the disease. Given its high mortality, early diagnosis is of utmost importance. Prevention and the anticipation of diagnosis begin with identification of potentially malignant lesions of the oral mucosa and with local conditions promoting chronic inflammation. Therefore, every lesion must be recognized promptly and treated adequately. As stated by the World Health Organization, any suspicious lesion that does not subside within two weeks from detection and removal of local causes of irritation must be biopsied. Surgical biopsy remains the gold standard for diagnosis of oral cancer [18]. The objective of this study is to investigate and analyze the prevalence, patterns, and characteristics of oral cancer within the context of a tertiary care hospital setting.

This study shows the majority of cases within the age groups of 45-54 years (52.4%) and 55-64 years (20.2%), indicating a higher susceptibility to oral cancer in these cohorts. Notably, individuals aged 35-44 years constitute 14.7% of the study population, emphasizing the presence of oral cancer across a broad age spectrum. The calculated mean age of the study population is 51.92 years with a standard deviation of 8.55. This findings consistent with several studies [1,3,5-9].

This study shows among the patient's males (77.9%) were more than females (22.1%). This findings are well agreement with other studies [5,6,10]. Similar gender distribution was noted in a study by Rahman et al [19]. where males constituted 76%, and females comprised 24%.

In this study, a significant number of oral cancer cases were identified on the tongue, consistent with numerous previous findings [20-23]. The preference for the tongue and cheek as sites for oral cancer is attributed to the accumulation of carcinogens in the oral cavity, mixing with saliva and pooling at the mouth's bottom, especially in areas covered by thin, non-keratinized mucosa. Khan et al [24] noted that the oral mucosa was the most common site, with the tongue following closely. Howell et al [25] reported that oral cancer primarily occurred on the lip, followed by the tongue, emphasizing the lip's vulnerability to ultraviolet light, particularly in regions like Australia with fair-skinned residents. In India, a study revealed the mandibular alveolus as the frequently affected site, linked to the prevalent practice of betel quid and tobacco chewing [26]. Habib et al [27]. Found the buccal mucosa to be commonly affected in the Bangladeshi population, potentially due to the high consumption of tobacco and betel products. The habit of retaining tobacco and betel ingredients in the buccal sulcus is considered a significant factor contributing to carcinoma development. While tertiary hospitals are actively involved in treating oral cancer, there is a need for improvements in other centers, including peripheral facilities, to enhance overall healthcare services. In this investigation, squamous cell carcinoma emerged as the predominant oral cancer type, constituting 96.1%, followed by Verrucous Carcinoma (1.4%), Basal cell carcinoma (0.8%), Adenoid cystic Carcinoma (0.6%), Melanoma (0.4%), spindle cell carcinoma (0.4%), and Mucoepidermoid Carcinoma (0.2%). This percentage surpasses findings from several prior studies, where squamous cell carcinoma ranged from 84.40% to 90% of all oral

cancer cases [13,15,21,26]. Conversely, some studies reported lower figures, ranging from 63.00% to 73.10% compared to the current study [10-12,23]. Anis and Gaballah's study [21] exhibited a similar trend, with squamous cell carcinoma being the most prevalent (70%), followed by Mucoepidermoid carcinoma (5.4%), Adenoid cystic carcinoma (2.7%), Adenocarcinoma (2.7%), Spindle cell carcinoma (1.4%), malignant melanoma (1.4%), and others. In Dhanuthai et al.'s study [20] also reported comparable results, with squamous cell carcinoma at 80.05%, followed by Verrucous carcinoma (3.41%), Mucoepidermoid carcinoma (3.02%), Adenoid cystic carcinoma (1.9%), Adenocarcinoma (1.07%), Malignant melanoma (0.60%), Spindle cell carcinoma (0.15%), and other types.

In the present investigation, the majority of patients were diagnosed at Stage III (65.6%), followed by Stage II (22.9%), Stage IVA (4.1%), Stage I (3.5%), and Stage IVB (2.7%) in descending order. This findings consistent with previous studies [1,5]. This pattern closely aligns with the findings of a study by Thomas, Stedman et al [15]. Where the staging results for squamous cell carcinoma were quite similar, with the highest number of patients in Stage I (29%), followed by Stage IV (26%), Stage II (15%), Stage III (14%), and unknown stage (16%). Similarly, in 2018, Sharma, Kim et al [16]. Conducted a study revealing that the highest proportion of squamous cell carcinoma patients were at Stage I (44.73%), followed by Stage II (5.26%), Stage III (22.36%), Stage IVA (23.68%), and Stage IVB (3.94%).

In the conducted study, the majority of participants were diagnosed with squamous cell carcinoma (SCC), and their histological patterns were predominantly Grade I (71.4%), followed by Grade II (23.9%), Grade III (3.5%), and Grade IV (1.2%). These findings are consistent with results from other studies [1,5]. In a study by Adhikari et al [31]. Similar results were observed, with histological patterns showing Grade I at 60.3%, Grade II at 32.8%, and Grade III at 6.9%. Rai et al. study [32] also demonstrated comparable findings, with Grade I at 50.8%, Grade II at 29.2%, Grade III at 20%, and Grade IV not noted.

## Conclusion

This study reveals that squamous cell carcinoma is the predominant malignancy affecting the oral cavity, with a higher incidence among males, and the tongue being the most frequently affected site. Among tertiary hospital centers, a significant number of oral cancer cases were reported. The majority of patients in the study presented with Grade I and Stage II squamous cell carcinoma in the oral cavity. Launch public health campaigns to raise awareness about the risks of oral cancer, emphasizing the higher incidence in males and the association with specific habits such as gutka, paan, betel nut, and tobacco consumption.

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