Short Communication

Oral Cancer Prevalence in a Tertiary Care Hospital in India

Kanchan Sawlani¹, Nitu Kumari¹, Ashwani Kumar Mishra² and Usha Agrawal¹*

¹National Institute of Pathology (ICMR), Safdarjung hospital campus, India
²NDDTC and Department of Psychiatry, AIIMS Teaching Block, India

Abstract

Oral cancer is fourth most common cancer in India and becoming a significant public health problem. Risk, cause and types of oral cancers are varying among the study and it became a major health problem. Efforts towards early detection and prevention will reduce this burden. In context of this, the present paper focuses on the association of clinic pathological parameters with the grade of oral squamous cell carcinoma (OSCC) and nodal metastasis during a 12-year period at National Institute of Pathology, India. A total of 42641 subjects were received during this period and 670 cases presented with oral lesions with a gradual increase of six fold in number of cases over the years. Oral cancer was found to be predominant in males in all the years. Incidence of high grade OSCC was more among younger individuals and higher lymph node metastasis was found in the 7th decade. Buccal mucosa was found to be the most common site of OSCC, with the involvement of lip increasing, and that of the alveolus decreasing over the years whereas lymph node metastasis increased considerably. Tobacco smoking and chewing habit is a common habit among the Indian population and the most probable risk factor for diseases occurrence. Health educational programs for awareness, government policies to ban sale of tobacco, early detection of lesions and community programs involving the health workers, dentists and allied medical professionals may contribute towards decreasing burden of disease.

INTRODUCTION

Oral cancer is the eleventh most common cancer worldwide. In India, 4 out of 10 of all cancers are oral cancers. According to the Oral Cancer Foundation India, 130,000 people succumb to oral cancer in India annually, translating approximately to 14 deaths per hour. Despite being one of the countries with the highest incidence of oral cancer, India lacks nation-wide oral cancer register. This implies that the increasing cancer incidence and risk among Indians needs to be addressed at a national level for prevention. Hence, epidemiological studies studying the disease pattern of oral cancer can prove beneficial for better understanding of etiology and pathology of oral cancer. The present study examines the age and gender based trend in the incidence of oral cancer in the last decade based upon the epidemiological data from a tertiary medical facility of northern India. Around 90% of oral cancers are of the squamous cell type (OSCC). The primary reason for such high proportion of oral squamous cell carcinoma in India is the mucosal alteration owing to chronic irritation and nitrosamines released from chewable tobacco, in the form of betel quid, gutka, snuff or misri [1]. The alteration may be genetic and leads to uncontrolled proliferation of cells. The cancer manifests itself as a non-healing ulcer or exophytic growth, which may be associated with pain, occasional bleeding and surrounding induration [2]. Other contributive factors include poor oral hygiene, faulty dental restorations or ill-fitting dentures causing friction, dietary factors or insufficient financial and social support to seek medical aid.

METHODS

Study Design

This is a retrospective analysis of all the cases of OSCC accessioned at the National Institute of Pathology (ICMR), New Delhi over 12 years (2001 to 2012). The lesion sites included were buccal mucosa, floor of the mouth, lip, alveolus, gingiva, gingivobuccal sulcus, palate and angle of mouth. Cases of squamous cell carcinoma of the tongue were excluded as this site is grouped with oropharynx in some studies [3,4]. This study was carried out at a tertiary referral cancer centre in a geographic area with a large burden of oral cancers. Of the 670 cases of oral lesions that were reported over 12 years from 2001 to 2012, there were 552 cases with a confirmed diagnosis of dysplasia or OSCC, and these were included in the study. Excluded cases (n=118) were those that had no signs of dysplasia/malignancy after histopathological examination, where the site of the
lesion was the tongue and pharynx or because the sample was inadequate or superficial. For the purpose of analysis, cases with mild, moderate and severe dysplasia were categorized together as one group named ‘Dysplasia’. Cases of well differentiated OSCC were designated as ‘Low Grade OSCC’ and those with moderate and poor differentiation were labeled as ‘High Grade OSCC’. Clinical information in terms of clinic pathological profile and site of lesion was available for all the 552 patients which were taken from the hospital records.

**Data Collection and Analysis**

The following data were systematically collected for all enrolled patients: (1) general information including date of sample collection, diagnosis at admission, operation or surgery performed, site of the lesion; (2) demographic characteristics at the time of diagnosis/admission including age, gender; (3) results of the clinical oral examination; (4) results of the histopathological examination of the lesion; (5) grade of OSCC; (6) presence or absence of lymph node metastases, margin involvement, extra-nodal extension, muscle involvement and bony invasion. The data was compiled and data analysis was performed using SPSS statistical software version 19.0 and association between categorical variables was analyzed with Chi-square test the two sided P<0.05 was considered statistically significant.

**RESULTS**

The total number of surgical pathology cases per annum from all organs received at National Institute of Pathology was almost the same with a mean of 3553. However, the number of OSCC cases received has increased by nearly six fold (18 in 2001 vs 102 in 2012) over this period. Although the peak age of presentation of oral cancer is in the fourth and fifth decades, an alarming increase in the number of young patients (less than 40 years of age) was observed. The number of cases in the younger age group showed a fluctuating pattern over the years ranging from 11% to 46%. Male preponderance for oral cancer was consistent throughout the year, with the M: F ratio ranging from 2.5:1 to 7.7. It was observed that incidence of high grade OSCC is more the 50% in age range 31-40 and higher lymph node metastasis is in the 7th decade. Buccal mucosa was found to be the most common site of OSCC, with the involvement of lip increasing, and that of the alveolar decreasing over the years whereas lymph node metastasis increased considerably (Table 1). The grade of cancer showed no significant variation when compared with site and age between dysplasia, LG and HG and between OSCC (p>0.05) and lymph node metastasis (Table 2).

**DISCUSSION**

OSCC is the most common type of cancer in India [5,10]. The present study shows a nearly six fold increase in the number of cases of oral cancer reporting to a tertiary care centre over a decade (2001-2012). The possible causes for this ascending trend could be increase in the tobacco chewing habits, lack of public awareness of oral cancer or better cancer detection modalities. The incidence of oral cancer in India is on the rise with male preponderance [11,14] and peak incidence in fourth and fifth decades [12,15]. An increasing number of cases being reported in the younger ages (<40 years) is the cause of concern [11,16-20]. This upsurge of oral cancer cases has, however, not altered the age of presentation in the population under study, which continues to peak between 41-60 years. Moreover, the age specific incidence of OSCC as observed in the study suggest the importance of regular oral examinations/cancer screening for people aged 40 years and above. The epidemiological information on OSCC by various researchers point out regional differences in different states of India, with Kerala reporting a decrease [21] and West Bengal reporting an increase [22] in the incidence. The gender based preponderance of oral cancer in India is also regional, tilting towards men in most parts of the country (with a Male: Female ratio of 2.9:1 in the current study) and towards women in South India owing to the prevailing practice of reverse smoking (chutta). [23] In the present study as well, it was detected that palatal involvement is more common among females. The site and size of the oral cancer lesion is in direct correlation with the causative factor of chronic irritation [24,32]. The habit of betel quid or puch placement in the gingivobuccal sulcus may account for localization of OSCC in the buccal mucosa and alveolus amongst Indians [10,14]. On the other hand, cigarette smokers show a predilection to other sites such as the lip and floor of the mouth as seen in some studies on the Western population [11,13]. The grade and metastatic status of oral cancer at the time of detection is vital as it determines the treatment plan and the prognosis [33,34]. In most countries, OSCC cases are usually low grade (T1N0 or T2N0) at the time of documentation due to the associated discomfort [11,13]. In contrast, studies in India show that most of the oral cancer cases are either moderately or poorly differentiated at the time of presentation, as confirmed by the retrospective analysis in the present study, the finding corroborating with Mehrotra et al [35]. This could be attributed to the lack of appropriate diagnostic facilities in rural areas, genetically induced rapid progression to a higher grade of cancer, or lack of motivation for discontinuing tobacco chewing habits especially in lower socioeconomic status of the society. Lesions at the angle of mouth were however found to be predominantly low grade suggesting that the pain associated with any activity involving the mouth in such lesions is an inducer to seek medical treatment. In the present study, nodal metastasis, which increases the morbidity and chances of recurrence of oral cancer manifold, [13] was found to occur in 54.5% of the cases where surgical lymph node dissection was performed [36,37]. The high probability of nodal spread of oral cancer in the population under study further emphasizes the need of efficient strategies for early detection and therapeutic intervention, so that prognoses of these patients are improved.

The present investigation depicts an increasing trend of OSCC over the years, especially among the younger individuals, or in spite of effective government policies over the last decade, such as the ban on the sale of cigarettes to minors by the Delhi government in 2001; the operational research studies on anti-tobacco community education in schools conducted by ICMR in 2000; the reiteration of Cabinet guidelines on smoking in public places in 1998; and, the recent Supreme Court ban on sale of tobacco products in 2010. Other factors which may influence are history of tobacco chewing, smoking, alcohol consumption; [38-40] socio demographic risk factors, [1-44] dietary factors,
### Table 1: Sample Characteristics.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of biopsies</td>
<td></td>
<td>3309</td>
<td>2458</td>
<td>2690</td>
<td>3400</td>
<td>3503</td>
<td>3140</td>
<td>3377</td>
<td>3877</td>
<td>4441</td>
<td>3713</td>
<td>4665</td>
<td>42641</td>
<td></td>
</tr>
<tr>
<td>Number of OSCC cases</td>
<td>N (%)</td>
<td>18(0.54)</td>
<td>44(1.79)</td>
<td>41(1.52)</td>
<td>42(1.24)</td>
<td>45(1.28)</td>
<td>55(1.75)</td>
<td>49(1.45)</td>
<td>44(1.13)</td>
<td>64(1.44)</td>
<td>87(1.94)</td>
<td>79(1.94)</td>
<td>102(2.18)</td>
<td>670(1.57)</td>
</tr>
</tbody>
</table>

### Table 2: Association of parameters with clinic pathological characteristics.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>Grade of Cancer</th>
<th>Lymph Node Metastasis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SCC</td>
<td>SCC</td>
</tr>
<tr>
<td>Age</td>
<td>≤10</td>
<td>1(100)</td>
<td>0(0)</td>
</tr>
<tr>
<td></td>
<td>20-30</td>
<td>4(80)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>41-50</td>
<td>35(23.6)</td>
<td>51(34.45)</td>
</tr>
<tr>
<td></td>
<td>51-60</td>
<td>27(18.49)</td>
<td>51(34.93)</td>
</tr>
<tr>
<td></td>
<td>71-80</td>
<td>11(32.35)</td>
<td>10(29.41)</td>
</tr>
<tr>
<td></td>
<td>81-90</td>
<td>0(0)</td>
<td>1(50)</td>
</tr>
</tbody>
</table>

---

Agrawal et al. (2014)  
Email: wagrawal@jesipath.gov.in
and presence of HPV infection [45]. These factors also impact the survival rate [46-51]. Overall, the findings, raises multiple questions that need appropriate attention through additional population based studies. Epidemiological screening programs at national level will highlight the disease burden due to OSCC, identify regional differences and causative factors and these may help contribute towards policy decisions. The present results reflect only a hospital based incidence and therefore population based statistics may exhibit different trends. Increased awareness of the causative factors involved in oral cancer and promotion of educational programs in lower socio-economic strata, especially targeted at younger age groups may help in decreasing the burden of disease due to OSCC.

REFERENCES


