Epidemiological and Clinico-Pathological Study of Oral Cancers in a Tertiary Care Teaching Hospital: An Institutional Study in Haryana
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Abstract
Background: Global cancer statistical data showed that India has one of the highest incidence rates of oral cancer worldwide. Early detection is extremely important as it results in lower morbidity and mortality. Aims: The present study was undertaken to analyse the clinical profile and epidemiological trends in oral cancer of a small population of Haryana in a tertiary care teaching dental hospital. Materials and Methods: A retrospective hospital record based study was carried out for the period of two years 2011-2013 in the department of Oral Pathology. This is the first data based study being reported for oral cancer in Haryana at a tertiary care teaching hospital. Out of 749 biopsies, 130 diagnosed with oral cancer were retrieved. Data was collected on the basis of patient’s record in the department of Oral Pathology and analysed in the form of percentage. Results: Alveolus was the most common site of ulceroproliferative form of oral cancer in the age group 50 years and above with male predominance in the present study. Conclusion: There is need to investigate the aetiology of oral cancer in patients of Haryana as the site and clinical presentation of oral cancer studied is quite different from the conventional sites and presentations of oral cancer as reported by other studies in the literature.

Key words: Alveolus; Epidemiology; Oral Cancer; Ulceroproliferative; Morbidity; Mortality.

Introduction
Cancer is one of the major threats to public health in the developed world and increasingly in the developing world. Oral cancer is a heterogeneous group of cancers arising from different parts of the oral cavity, with different predisposing factors, prevalence and treatment outcomes. It is the sixth most common cancer reported globally with an annual incidence of over 30000 cases, of which 62% arise in developing countries. There is evidence that this oral cancer is more common in the developing countries in contrast to the developed ones, with highest oral cancer rates being found in Melanesia, South-Central Asia, Central and Eastern Europe and lowest in Africa, Central America, and Eastern Asia for both males and females.

Oral cancer ranks number one among men and number three among women in India. Estimates based on weighted averages of crude incidence rates for three large metropolitan cities covered under the National Cancer Registry Project revealed oral cancer constitute 12% of all cancers and 8% of all cancers in women. Surveys in various cancer hospitals in India reveal a frequency ranging from 15% to 20% for oral cancer among all cancers.

The cancer epidemic in developed as well as developing countries is due to the combined effect of ageing of populations and the prevalent risk factors. Risk factors for oral cancers include alcohol use, smokeless tobacco products and HPV infections, smoking and alcohol having synergistic effects. Oral cancer burden varies across different regions due to the variable contribution of each of these risk factors in different populations. Smokeless tobacco products and betel quid with or without tobacco are the major risk factors for oral cavity cancer in India and other neighbouring countries. Majority of oral cancers have been observed to arise from longstanding premalignant lesions especially in high incidence areas. Oral cancer is largely preventable by avoiding known risk factors. National and International guidelines have been made which emphasise and stress the importance of early detection of cancer.

Study design
A retrospective record based study was carried out in the Department of Oral Pathology, Post Graduate Institute of Dental Sciences, Rohtak, Haryana. It is a tertiary health care centre where teaching as well as
dental care is provided and it caters to the needs of rural as well as urban population of the Haryana district. A total of 749 biopsies which were diagnosed during the period of two years (Jan 2011 to Dec 2013) were studied. Out of these 130 biopsies with a histopathological diagnosis of oral cancer (Squamous cell carcinoma) were reviewed. Ethical committee of the institute approved the study. Data was collected on the basis of biopsy requisition form filled by the operators during submission of biopsies in the department of oral pathology which included patient’s age, gender, anatomical location and clinical presentation of lesion in the oral cavity. Data recorded for these two years was entered in Microsoft excel and analysed in the form of percentage and proportions whenever appropriate.

Results
In the present study out of total 130 biopsies diagnosed with oral cancer, 91 (70%) were males while 39 (30%) were females. The male to female ratio was 7:3 for the two studied years. 4% of the subjects were less than 30 years of age, 41.53% were between the age group of 30-50 years and 55.38% were above 50 years of age (Graph 1).

With respect to the site of involvement, alveolar mucosa was the most common site of presentation which constituted 37.9% of the total subjects followed by buccal mucosa (26.2%) tongue & vestibule (10.9%) and palate being the least involved (5.10%) (Graph 2). Examination of clinical presentation of oral cancer from the archival requisition forms showed that ulceroproliferative to be the most common (74.5%), followed by exophytic (13.6%), soft tissue swelling (10.4%) and erythematous (1.6%) being the least common (Graph 3).

Discussion
Oral cancer is the sixth most common cancer reported globally with an annual incidence of over 3000,000 cases, of which 62% arise in developing countries. In United States, oral cancer constitutes only about 3% of malignancies, 40% of all cancers in South Asian countries and 30% of all cancers in India. Oral cancer is ranked as most common cancer in males with an annual incidence of 45,455 and a mortality of 31,102. It is the fourth most common cancer in females, with an annual incidence of 24375 and mortality of 16551.6 According to population based cancer registry (PBCR) Chennai 2003-05, the number of cases per year indicated a male preponderance in the ratio of 420 females to 1000 males.6 Our present study also shows male preponderance with 91 males and 39 females. Similar sex distribution has been reported by many authors. In a study by Patel et al., at Gujarat, 75% of the patients were males.7 Mehrotra et al., from Allahabad, India reported a male:female ratio of 3.27:1.8 Iype EM et al., from Trivendrum, Kerala found higher preponderance in males (70%) compared to females (30%).9
In a study conducted by Giri et al., to know the incidence of oral cancer in western Maharashtra, it was found that majority (64.9%) of the patients were males and only 35.07% were females with male to female ratio of 1.85:1 for five studied years.\textsuperscript{10} In contrast Moore et al., in 2000 and Patel et al., in 2011 reported an increasing trend of oral cancer affecting tongue more in women as compared with that of men.\textsuperscript{11,12}

In the present study 4% of the biopsies were of patients less than 30 years of age, 41.53% were between the age group of 30-50 years and 55.38% were above 50 years of age. There are number of Indian studies which show the peak age frequency of occurrence of oral cancers in the fifth decade of life, at least a decade earlier than that in western literature.\textsuperscript{9,13} Krishnamurthi and Ramshankar studied oral cancer among non-tobacco users in South Indian population and found that mean age of occurrence among them was 53.4 years and majority of patients were in the age group of 51-70 years.\textsuperscript{6} This was also in agreement with the results of present study.Similar to the results of present study Giri et al., 2013 in Maharashtra also observed the overall highest occurrence (29.85%) at the age group more than 60 years, followed by 23.54% at age group 50-60 years, with lowest occurrence at age less than 30.\textsuperscript{10}

Sharma and Krishna study shows that majority of cases of oral cancer were seen in 4\textsuperscript{th} and 5\textsuperscript{th} decades whereas in the present study commonest age group to get oral cancer is above 50 years of age (55.38%) and is followed by age group 30-50 years (41.53%) and less than 30 years (4%).\textsuperscript{13,14} The incidence of oral cancer in young adult ranges between 0.4%and 5.5% which is also in concordance with the results of the same age group (4%) in present study.\textsuperscript{5,16} Total 633 oral cancer patients in Gorakhpur, Maharashtra were reviewed by Giri et al., 2013 out of which oral cancer occurring at buccal mucosa was 37.12%, tongue (36.8%), oropharynx (4.74%) and lip & palate (3.15%). The highest proportion being buccal mucosa followed by tongue and lowest being lips and palate.\textsuperscript{10} In the present study oral cancer in alveolus accounted to be highest i.e. 37.95% followed by buccal mucosa (26.2%), tongue and vestibule (10.9%) and least being palate (5.1%).

In another study conducted by Patel et al., in Surat, Gujarat the tongue was the most common site (23.02%), followed by alveolus, lips and cheeks.\textsuperscript{7} Mehrotra et al, in their study found tongue to be the most common site (42.5%) followed by cheek (19.14%).\textsuperscript{15} Iype EM et al., also found tongue as the most common site (52%) followed by cheek (26%), alveolus (10%), palate (4.5%), lip (2.3%) and floor of mouth (1.9%). In contrast to the above mentioned studies, in the present study no single case of oral cancer affecting tongue was noticed and maximum cases were seen on the alveolus. Agrawal and Rajderkar reported tongue to be the most frequently involved site followed by buccal mucosa.\textsuperscript{7}

Shenoi et al., in 2012 reported that mandibular alveolus was the most frequently site involved in oral cancer (45.7%) followed by buccal mucosa (23.7%), tongue (18.31%) and maxillary alveolus (5.76%).\textsuperscript{16} The results of Shenoi et al., were in concordance with the results of present study. Similar to the results of our study, Khandekar et al., in Nagpur also reported 55% of oral cancer in alveolus.\textsuperscript{9}

The most common clinical presentation of oral cancer in the present study was ulceroproliferative (74.5%) which is in accordance with the results of the study by Mathur et al., where they found ulceration with papillary infiltration type of clinical presentation of oral cancer (52.9%).\textsuperscript{20} The similar findings were also suggested Bylshiyama et al.\textsuperscript{21} Syam Sundar et al., conducted a study in Andhra Pradesh and found in their study that ulceration followed by swelling was the most common presentation of oral cancer in their institute.\textsuperscript{22} According to Wahiet al., most tumours of oral cavity ulcerate, this could be due to the friction of mucous membrane during eating.\textsuperscript{23}

Interpretation of data from a single institution has its clear limitations. The data reflects specific patient population reporting to the hospital and not the community as a whole. Alcohol consumption along with tobacco use greatly increases the risk of oral cancer but due to the partial information regarding these habits in the requisition form by the operator, this criterion was not included in our study. This study was limited by the fact that it was a retrospective survey and the specific site predilection for oral cancer could not be correlated with dietary and
tobacco habits. Primary preventive measures including education and awareness programs utilizing oral self-examination, toluidine blue staining, exfoliative cytology and brush biopsy are necessary.

Conclusion
Haryana is a small agriculture based state of North India. Most of the population lives in villages. No population based or centralised hospital oral cancer registry is available in Haryana. Such studies are necessary to draw attention of the authorities to the growing need of intensive public oral health efforts that aim to raise the population awareness about risk factors of oral cancer as well as importance of early diagnosis and treatment. In comparison with the United State population where oral cancer represents only 3% of malignancy, in India it accounts 30% of all cancers. This variation in incidence and pattern of cancer is due to regional differences in the prevalence of risk factors. So more and more such data based analysis or research should be done in order to record the risk factors prevalent among the population of Haryana.

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