A Comparative Study of Oral Squamous Cell Carcinoma in the Young and the Old in Sri Lanka

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Abstract
Oral squamous cell carcinoma (OSCC) is a major oncological problem in many regions of the world where tobacco habits are practiced in the form of chewing and/or smoking with or without alcohol intake. In Sri Lanka, OSCC is the commonest cancer in males and nearly 5% of OSCC are diagnosed in young patients. This comparative study describes demographic, aetiological and histological difference between young and old patients with OSCC. Both younger and older groups showed a marked male predilection (male:female ratio was 4:1 and 3.7:1 in younger and older groups respectively). Tongue was the commonest site for younger group (41%, P < 0.01) whilst buccal mucosa (37.5%, P < 0.05) and alveolar mucosa (25%, P < 0.01) were for older group. 39% of cancers in younger group were not associated with any identifiable risk factor (P < 0.01) and 70% of SCC of the tongue has no associated habits (P < 0.01). Although there was no significant difference between two groups regarding the three grading systems, a significantly higher number of nuclear aberrations were found in younger group (P < 0.001).

Introduction
Oral squamous cell carcinoma (OSCC) ranks as the 3rd most common cancer after the stomach and cervical cancer in developing countries.

Unfortunately, in this part of the world where oral cancer is most common, descriptive information on incidence, mortality and prevalence is least available. Oro-pharyngeal carcinoma is a major oncological problem in many regions of the world where tobacco habits are practiced in the form of chewing and/or smoking with or without alcohol intake. Such habits are practiced by certain groups in Sri Lanka and other parts of South Asia. Thus oral cancer is the commonest form of cancer among men in Sri Lanka. Although there is evidence to say that smoking and consumption of alcohol over a considerable period of time could be risk factors for oral cancer in older age groups, there has not been enough evidence to claim the same relationship in the young. Several studies have attempted to identify the risk factors for OSCC in young patients and little is known about its possible etiology and therapeutic management. It has been reported that tumours in the young mainly affecting the tongue show invasive characteristics. The outcome of treatment for OSCC is reported to be similar for both younger and older patients when the extent of the lesion is similar. The studies to compare the different parameters of OSCC in younger and older patients appear to be exceptionally sparse in the literature. In the present study, we selected two groups based on the age of the patient as younger (<40 years) and older (≥50 years).
The histopathological grading of tumours has been used for many decades in an attempt to predict the clinical behaviour of squamous cell carcinoma. Very few studies have analyzed the pathology of these lesions to confirm whether these lesions are histologically similar\(^7\). In the present study we compared both clinical and histological features of OSCC in the young and old groups.

**Materials and methods**

The study sample comprised of 112 previously untreated oral squamous cell carcinoma patients retrieved from archives of the Department of Oral Pathology, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka. The patients who were 40 years and less were considered the “younger age group” and the patients who were 50 years and over were considered “older age group” (56 patients from each group). The older group was randomly selected during the same time period that the young cancers were received (from January 1996 to December 2001). Clinical information was recorded from patient records. Additional information such as income level, occupation and survival data were gathered from the patients as well as relevant consultant units by sending a pre-tested questionnaire. Socio-economic status was analyzed using their occupation, monthly income level and number of family members. The follow-up data was used to analyze the recurrence and survival rates. For histopathological evaluation all cases were stained with haematoxylin and eosin (H & E). A representative section containing the full thickness of the tumour (including invasive front), together with other sections were used for histopathological gradings. Bryne et al.’s\(^8\) grading system was used to grade the tumours. Chi-Square test was used to analyze the data.

**Results**

There was a male predominance in both groups with a male: female ratio of 4:1 and 3.6:1 in young and old groups respectively. Buccal mucosa (P< 0.05) was the commonest site in the older group while the tongue was the culprit in the younger group (p<0.01). Second common site was alveolar ridge in the old when compared to the young group (p<0.01). Considering the habits both groups consumed tobacco and alcohol. Only 18% of young category practiced tobacco chewing with all the ingredients whilst it was 37% in the old (p<0.05). 47% of older group smoked and it was 27% in the young group and the results were not statistically significant. It is interesting to note that all young patients only smoked cigarettes while others smoked beedi as well. Female patients did not have any smoking habits. In regard to the primary site 70% of tongue cancers in the young group had not practiced any habits. In contrast, primary tongue cancer patients in the old group practiced some kind of habit (p<0.01).

Some authors described that the individual parameters have a prognostic value; hence we examined the individual histopathological parameters in the whole tumour area, according to the method of Bryne et al.\(^8\). Anaplasia or loss of differentiation is a characteristic feature of cancer cells, and it consists of morphological and functional changes. Interestingly, a significantly higher number of nuclear aberrations were found in the younger patients compared to older patients (P < 0.001). Lymph node metastasis was more in older group when compared to younger patients (p<0.05). Some authors have suggested that cancer in young adults tends to be more frequently anaplastic resulting in a more aggressive behaviour and poor prognosis\(^9,10\). We found that well, moderately and poorly differentiated carcinomas are more or less equally distributed within the two age groups.

Recurrence rate of younger group is higher when compared with old group and it was 39% and 30% respectively and was not significant statistically. Three year survival rate of younger group was 91% and 86% in the old patients and was not significant statistically. Females in the younger group had better survival than
the females in the older group and it was 90% and 75% respectively. In contrast males in both groups showed more or less equal three year survival rates and it was 88% in the young and 86% in the old. Overall males showed 74% three year survival and in females it was 83%.

Discussion

Oral cancer is the commonest cancer among men in Sri Lanka. Confirming the above fact, the present study showed that the male to female ratio in the young was 4:1 and in the old was 3.7:1. In Sri Lanka, the smoking habits and intake of alcohol are not common among females, although the habit of betel chewing among females appear as common as that of males. This may be one of the reasons why OSCC is commoner among males than females. Although it is well known that the majority of oral cancer patients are from older age groups, there is a trend of rising incidence of oral cancer in younger patients, particularly in the tongue. Many recent studies reported that 4-6% of oral cancers occur at ages younger than 40 years\(^{11}\).

Cultural habits such as betel chewing and consumption of other forms of tobacco in South Asia is one of a major risk factors. In Western Europe, greater use of alcohol is the other factor to develop OSCC especially in the floor of the mouth\(^{12}\). The synergistic effect of tobacco and alcohol is known to be greater in increasing the risk of cancer than chewing or smoking alone\(^{13}\). Recent evidence suggests that the areca nut itself is carcinogenic and is the aetiological agent causing oral submucous fibrosis, which is a potentially malignant condition. The present study also showed that 56% of the total sample had the chewing habit and 75% of old group consumed betel quid. Many retrospective studies reported that young patients without habit had tongue cancers and they proposed that the etiology would be multifactorial\(^{14,15}\). Similarly in the present study patients below 40 showed no history of any habits, especially female patents.

Although western countries showed 5% of buccal cancers, 50% of the cases were in buccal mucosa in Indian population due to the habit of betel chewing\(^{16}\). The main reason was that the chewers used to keep the quid in their buccal pouch for longer hours. This may be the reason to have more buccal and alveolar ridge cancers among Sri Lankans and Indians. In western countries the common sites were the lower lip, floor of the mouth and tongue due to alcohol consumption, smoking and exposure to sunlight\(^{17-19}\).

There are reasons to believe that the aetiology and pathogenesis of the OSCC may be different in younger patients compared to older patients. A shorter duration of exposure to environmental carcinogens and lack of pre-existing lesion in the former suggest the possibility of different molecular mechanisms in the two groups.

The system introduced by Bryne et al included not only an analysis of the cell population of cancer, but also an evaluation of the tumour host relationship and the system focused more on deep invasive front of the tumour\(^{8}\). It has been proven that invasive front characteristics have a prognostic value\(^{8,10}\).

In the present study, we found that the differentiation of tumours (well, moderate, poor) showed no difference between the two groups. In contrast, some authors described that majority of the tumours of young adults were well differentiated\(^{20,21}\). So far, there are no studies comparing the young and the old OSCC with regard to individual histological parameters in the literature. In the present study, a significantly higher amount of nuclear aberrations were found in younger patients. Some authors suggested that tumours in those less than 40 years behave aggressively\(^{22,23}\).

In conclusion, oral squamous cell carcinoma in both the younger and older groups shows a marked male predominance. Tongue was the
commonest primary site in the young group. For the older group buccal mucosa followed by alveolar ridge appear to be the common sites. Although OSCC of younger patients showed more nuclear aberrations, the older patients had more proliferative tumours with higher lymph node metastasis. Further, existing histopathological grading systems show that the two groups are equally distributed among them. Therefore, we suggest, studies of genome-wide analysis are necessary, other than histopathological features, in deciding the prognosis and survival of these two important categories.

Acknowledgements
Authors would like to thank the patients and their respective consultants for clinical information and the technical staff of Oral Pathology Department. This work was supported by a grant from the Sri Lanka Dental Association.

References


