



Epidemiology of oral lip and tongue cancer: Patients study at IRNUM hospital Peshawar, Pakistan

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Abstract

There are several types of oral cancers, but around 90% are squamous cell carcinomas, originating in the tissues that line the mouth and lips. In the present study, we assess the frequency of mouth and lip cancer, different grades and treatment strategies in various groups divided on the bases of age, economic and marital status. The data was collected from the biochemistry department of the Institute of Radiotherapy and Nuclear Medicines (IRNUM) cancer hospital, situated in Peshawar, Khyber Pakhtunkhwa (KPK), in a period of January to December 2010. Data analysis indicated that there were 77 cases of oral cancer, including 66% males and 34% females. The results showed that people in age groups 51-60- and 61-70 were mostly affected (27.27%). Most of the patients (51.95%) were treated with radiotherapy (RT). Majority presented in the well-differentiated grade 1 (42.86 %). The high Incidence rate was investigated in married patients (4.81%). The most affected peoples occupation wise were house wives (28.57%), including lip patients (22.50%) and tongue patients (35.13%) followed by farmers (15.85%), including oral lip patients (15%) and oral tongue patients (16.21%). The other common site was oral lip cancer (52%). Data analysis revealed that out of 40 oral lip cancer patients, 40% were males and 12% were females. A large number of oral lip cancer patients (50%) were treated with radiotherapy. Predominant incidence (32.50%) was in the well differentiated grade 1. The married diseased subjects were highly affected (95%) as compared to unmarried. Radiotherapy was the most common treatment (50.05%). Advance age groups, especially house wives and farmers were mostly affected by mouth and oral lip cancer. Mostly the cancer was in the well-differentiated grade 1, treated mainly by radiotherapy.

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Introduction

Oral cancer is a common malignancy and is a most important reason of cancer morbidity and mortality worldwide (Peter *et al.*, 2005). Mainly oral cancers are squamous cell carcinomas and the huge mainstreams are summited by pioneer lesions that can be present as leukoplakia, erythroplakia, or erythroleukoplakia (Melrose, 2001; Mayne *et al.*, 2006). Oral cancer is a severe trouble of municipal health with more than 200,000 new cases recorded annually throughout the world (Parkinet *et al.*, 1999). It remains high at about 50 percent as well as contemporary medical services are possibly due to detection only at the advance stage of this disease is the cause of all together mortality (Pisani *et al.*, 1999). In Pakistan and other several countries of the world, oral cavity carcinoma is encircling the first ten common malignancies (PMRC, 1982; WHO, 1982). Nearly 96% of oral cancer diagnosed at more than 40 years of age and over 50% of all cancers arise in individual above than 65 years (Edwards *et al.*, 2002). Oral cavity carcinoma for both sexes in Pakistan is the second most typical malignant tumor (PMRC, 1982). Smoking, areca nut, betel quid or paan, tobacco chewing, naswar, paan masala, gutka and poor nutrition is the key risk factors causes of oral cancer in Pakistan. Socially, smoking is regarded as an incompatible habit for females; on the other hand, chewing rate practice is high in all circles of socio-economic. Age-specific rates in the 7th decade of both sexes consistently demonstrated the highest growth (Bhurgrri *et al.*, 2003). High incidence rate in Karachi and Sindh, subsequent by the Punjab and lowest prevalence in Peshawar has been noted (Chaudhry *et al.*, 2008). The occurrence of Oral Squamous Cell Carcinoma (OSCC) is high in males (76%) than females (24%) and 80 out of 100 patients with OSCC had a positive history of snuff (Naswar) dipping. The common type of smokeless tobacco is Naswar and 64% of the population of both sexes is using it in the periphery of Peshawar (Shah *et al.*, 1993). Lip cancer in some parts of the western world is a widespread oral cancer malignancy, for instance Australia, Canada, Spain and Finland (Tarvainen *et al.*, 2004).

Overall prevalence of lip SCC is higher in Caucasian men (Tarvainen *et al.*, 2004). Lip SCCs are not as much of probable to cause death rate as other malignancies of the OC (Veness *et al.*, 2001). Ninety-five percent of the patients are males and it frequently occupied the lower lip (Menck *et al.*, 1991). Some of the possible causative agents for lip cancer are tobacco and ultraviolet exposure (Lindqvist and Teppo, 1978; Wynder *et al.*, 1983). The most cases of lip carcinoma arise on the lower lip, which has maximum sun exposure as compared to the upper lip whereas tobacco has been powerfully connected with lip cancer (Naylor and Farmer, 1997). In women report in Los Angeles, it was found that the daily use of lip protection (mostly colored lipstick) can decrease the risk of lip cancer (Pogoda and Preston-Martin, 1996). If a patient depreciated, complete restaging must be done, the appropriate additional therapy should be selected (Harrison *et al.*, 1999). Lip cancer includes the major subtype of oral cancer. It is quite frequent among the majority in white populations (Waterhouse *et al.*, 1976). After lip, tongue is the most well-known tumor of oral cavity (Menck *et al.*, 1991). For several countries, the tongue is considered to be the most important (20-40%) site of appearance of oral cancers within OC (Gorsky *et al.*, 2004). In India, buccal mucosa is the prevalent site where the betel (the main risk factor for oral cancers in this area) is habitually apprehended (Warnakulasuriya and Ralhan, 2007). The prevalence of this cancer is expanding in young individuals (Iamaroon *et al.*, 2004).

The present study was aimed to investigate

- Oral lip and tongue cancer frequencies according different age groups and gender wise.
- To identify grades, marital status and treatment type of oral lip and tongue cancer patients.
- To determine the high frequency of oral lip or tongue cancer in diseased subjects.

Methods and materials

Data collection

The data was collected in a period of January to December in 2010 year from the Institute of

Radiotherapy and Nuclear Medicines (IRNUM) cancer hospital, situated in Peshawar, Khyber Pakhtunkhwa (KPK), where the majority of cancer patients are visiting for treatment and diagnosis. The principal source of information was the file of histopathological reports in the Biochemistry Department of Hospital. Total 77 patients including 51 males and 26 females were included during the study period.

Questionnaire

A standard questionnaire was filled from oral cancer patients regarding their names, age, marital status, sex, site of cancer,

occupation, habit, nature of the treatment and stage of the patient attended the IRNUM cancer hospital.

Statistics

Microsoft Excel was used for the data analysis. For each aspect, the analyzed data was presented in percentage.

Results

Age wise prevalence of oral malignant individuals

Table 1 shows the detail of the OC prevalence in study population. OC was mostly prevalent in two age groups, 51-60 years (27.27%) and 61-70 years (27.27%).

Table 1. Prevalence of oral cancer according to different age groups.

| Age group | Number of patients | Male | Female | Proportion rate % |
|-----------|--------------------|-------------|------------|-------------------|
| ≤10 | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| 11-20 | 2 | 2 (3.92%) | 0 (0.00%) | 2.59% |
| 21-30 | 2 | 1 (1.96%) | 1 (3.85%) | 2.59% |
| 31-40 | 10 | 4 (7.84%) | 6 (23.08%) | 12.98% |
| 41-50 | 12 | 8 (15.69%) | 4 (15.38%) | 15.60% |
| 51-60 | 21 | 15 (29.41%) | 6 (23.08%) | 27.27% |
| 61-70 | 21 | 16 (31.37%) | 5 (19.23%) | 27.27% |
| ≥70 | 9 | 5 (9.80%) | 4 (15.38%) | 11.70% |
| Total | 77 | 51 | 26 | 100.00% |

Age wise prevalence of oral tongue cancer in study population

Our data showed that the incidence of tongue cancer

was high in age group 51-60 years. Details of the results are summarized in Table 2.

Table 2. Prevalence of tongue cancer in different age groups.

| Age group | Number of patients | Male | Female | Proportion rate % |
|-----------|--------------------|------------|------------|-------------------|
| ≤10 | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| 11-20 | 2 | 2 (10.00%) | 0 (0.00%) | 5.41% |
| 21-30 | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| 31-40 | 8 | 3 (15.00%) | 5 (29.41%) | 21.62% |
| 41-50 | 7 | 3 (15.00%) | 4 (23.53%) | 18.92% |
| 51-60 | 9 | 6 (30.00%) | 3 (17.65%) | 24.32% |
| 61-70 | 8 | 4 (20.00%) | 4 (23.53%) | 21.62% |
| ≥70 | 3 | 2 (10.00%) | 1 (5.88%) | 8.11% |
| Total | 37 | 20 | 17 | 100.00% |

Age wise prevalence of oral lip cancer

Our result analysis showed that the incidence of tongue cancer was high in age group 61-70 years. Details of the results are summarized in Table 3.

Gender wise prevalence of oral cancer

A total of 77 patients have been studied in which 51

patients were males and 26 patients were females.

The available data indicates that out of 77, 40 (52%) were oral lip cancer and 37(48%) were oral tongue cancer patients. The incidence rate of oral cancer was more frequent in males as compared to females (Table 4).

Table 3. Prevalence of oral lip cancer in different age groups.

| Age group | Number of patients | Male | Female | Proportion rate % |
|-----------|--------------------|-------------|------------|-------------------|
| ≤10 | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| 11-20 | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| 21-30 | 2 | 1 (3.23%) | 1 (11.11%) | 5.00% |
| 31-40 | 2 | 1 (3.23%) | 1 (11.11%) | 5.00% |
| 41-50 | 5 | 5 (16.13%) | 0 (0.00%) | 12.50% |
| 51-60 | 12 | 9 (29.03%) | 3 (33.33%) | 30.00% |
| 61-70 | 13 | 12 (38.71%) | 1 (11.11%) | 32.50% |
| 71-80 | 6 | 3 (9.67%) | 3 (33.33%) | 15.00% |
| Total | 40 | 31 | 9 | 100.00% |

Table 4. Gender wise prevalence of oral cancer.

| Gender | Number of Patients | Oral Lip Cancer | Oral Tongue Cancer | Proportion rate % |
|--------|--------------------|-----------------|--------------------|-------------------|
| Male | 51 | 31 (40%) | 20 (26%) | 66% |
| Female | 26 | 9 (12%) | 17 (22%) | 34% |
| Total | 77 | 40 (52%) | 37 (48%) | 100.00% |

Type of treatment experienced for oral cancer patients

Data analysis showed that out of 77 patients, 40 (51.95%) patients were treated with radiotherapy, 25 (32.47%) with Radio-chemo therapy, 7 (9.09%) with

chemotherapy, 2 (2.60%), with Radio-surgical therapy, while the treatment of remaining 3 (3.89%) patients suffering from oral cancer was unknown. There was no patient under surgical therapy (Table 5).

Table 5. Prevalence of oral cancer patients based on different types of treatment.

| Treatment | Number of patients | Male | Female | Proportion rate % |
|------------------------|--------------------|-------------|-------------|-------------------|
| Radiotherapy | 40 | 29 (56.86%) | 11 (42.31%) | 51.95% |
| Chemotherapy | 7 | 0 (0.00%) | 7 (26.92%) | 9.09% |
| Surgical therapy | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Radio-Chemotherapy | 25 | 19 (37.26%) | 6 (23.07%) | 32.47% |
| Radio-Surgical therapy | 2 | 1 (1.96%) | 1 (3.85%) | 2.60% |
| Unknown | 3 | 2 (3.92%) | 1 (3.85%) | 3.89% |
| Total | 77 | 51 | 26 | 100.00% |

Type of treatment experienced for oral tongue malignant patients

The results of 37 patients are summarized in Table 6.

Types of treatment experienced for oral lip cancer patients

The results of 40 patients are summarized in Table 7.

Frequency of patients according to different clinical grades of oral cancer

As for as differentiation (grading) of cancer were concerned,

the recorded data showed that 33 (42.86%) out of total 77 patients were in well-differentiated (grade-I) oral cancer. Similarly, 19 (24.67%) patients were in moderately-differentiated (grade-II), 6 patients (07.80%) were in poorly-differentiated (grade III) and no patients in un-differentiated (grade IV) oral cancer.

While the grades of remaining patients 19(24.67) were unknown. The majority of the diseased subjects were in well-differentiated grade (Table 8).

Table 6. Prevalence of tongue cancer patients based on different types of treatment.

| Treatment | Number of patients | Male | Female | Proportion rate % |
|------------------------|--------------------|-------------|------------|-------------------|
| Radiotherapy | 20 | 13 (65.00%) | 7 (14.18%) | 54.05% |
| Chemotherapy | 2 | 0 (0.00%) | 2 (11.76%) | 5.41% |
| Surgical therapy | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Radio-Chemotherapy | 11 | 5 (25.00%) | 6 (35.30%) | 29.72% |
| Radio-Surgical therapy | 2 | 1 (5.00%) | 1 (5.88%) | 5.41% |
| Unknown | 2 | 1 (5.00%) | 1 (5.88%) | 5.41% |
| Total | 37 | 20 | 17 | 100.00% |

Table 7. Prevalence of lip cancer patients based on different types of treatment.

| Treatment | Number of patients | Male | Female | Proportion rate % |
|------------------------|--------------------|-------------|------------|-------------------|
| Radiotherapy | 20 | 16 (51.62%) | 4 (44.44%) | 50.00% |
| Chemotherapy | 5 | 0 (0.00%) | 5 (55.56%) | 12.50% |
| Surgical therapy | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Radio-Chemotherapy | 14 | 14 (45.16%) | 0 (0.00%) | 35.00% |
| Radio-Surgical therapy | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Unknown | 1 | 1 (3.22%) | 0 (0.00%) | 2.50% |
| Total | 40 | 31 | 9 | 100.00% |

Frequency of the population according to grade differentiation of oral tongue cancer

Results are summarized in Table 9.

Frequency of diseased individuals according to differentiation (grading) of oral lip cancer

Results are summarized in Table 10.

Prevalence of oral cancer according to occupation

Our results (Table 11) showed that oral cancer is common in house wives 22 (28.57%) and other occupations 33 (40.25%).

Table 8. Differentiation of clinical grades of oral cancer.

| Differentiation | Number of patients | Male | Female | Proportion rate % |
|---------------------------------------|--------------------|-------------|-------------|-------------------|
| Well-differentiated (grade I) | 33 | 19 (37.25%) | 14 (53.85%) | 42.86% |
| Moderately- differentiated (grade II) | 19 | 15 (29.41%) | 2 (7.69%) | 24.67% |
| Poorly-differentiated (grade III) | 6 | 6 (11.77%) | 0 (0.00%) | 7.80% |
| Un-differentiated grade IV) | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Unknown | 19 | 11 (21.57%) | 8 (30.76%) | 24.67% |
| Total | 77 | 51 | 26 | 100.00% |

Incidence of oral cancer according to marital status

The results are summarized in Table 12. Highest incidence of oral cancers both in male and female were observed in married individuals as compared to unmarried.

Discussion

In the present hospital-based study, male were more affected (66%) than female (34%) patients. Male to female ratio was around 2:1.

Our findings were in line with other reports that male patients were more affected as compared to female (Canto and Devesa, 2002; Iamaroon *et al.*, 2004). Similar observations were also observed by Ostman *et al.* (1995) and chen *et al.* (1999), but disagreed with other studies that oral cancer was more frequent in female (Paymaster, 1956; Jagannatha, 2005) which might be due to differences in society as, in Pakistani population males are more exposed to cigarette, snuff and other drugs as compared to females.

Table 9. Differentiation wise distribution of tongue cancer in subject population.

| Differentiation | Number of patients | Male | Female | Proportion rate % |
|---------------------------------------|--------------------|------------|-------------|-------------------|
| Well-differentiated (grade I) | 20 | 8 (40.00%) | 12 (70.59%) | 54.05% |
| Moderately- differentiated (grade II) | 8 | 6 (30.00%) | 2 (11.76%) | 21.62% |
| Poorly-differentiated (grade III) | 2 | 2 (10.00%) | 0 (0.00%) | 5.41% |
| Un-differentiated grade IV) | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Unknown | 7 | 4 (20.00%) | 3 (17.65%) | 18.92% |
| Total | 37 | 20 | 17 | 100.00% |

Our results showed that most of the oral malignant patient's belonged to unskilled groups including, farmers and manual workers (71.42%) and confirmed other findings that majority of infected population was unskilled group people (73%) (Franceschi *et al.*, 1991; Jagannatha, 2005). Several studies reported that occupation as a farmer or manual worker indeed increase the risk of

oral cancer (Balaram *et al.*, 2002; Victor, 2002). In present study we examined that farmers and other outdoors have great risk for lip cancer. Further evidence in favor of this hypothesis has been found in the observation of an excess risk of lip cancer among farmers and other outdoor workers (Nicolau and Balus, 1964; Keller, 1970; RGSREW, 1975).

Table 10. Grades wise distribution of oral lip cancer in diseased subjects.

| Differentiation | Number of patients | Male | Female | Proportion rate % |
|---------------------------------------|--------------------|-------------|------------|-------------------|
| Well-differentiated (grade I) | 13 | 11 (35.49%) | 2 (22.22%) | 32.50% |
| Moderately- differentiated (grade II) | 11 | 9 (29.03%) | 2 (22.22%) | 27.50% |
| Poorly-differentiated (grade III) | 4 | 4 (12.90%) | 0 (0.00%) | 10.00% |
| Un-differentiated grade IV) | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Unknown | 12 | 7 (22.50%) | 5 (5.56%) | 30.00% |
| Total | 40 | 31 | 9 | 100.00% |

In our study maximum number of patients belonged to well differentiated grade I oral cancer 33 (42.86%), moderately differentiated grade II- 19 (24.67%) and finally poorly differentiated grade III- 06 (07.80%). The pattern of present patients grades were matching with the results of Jagannatha (2005) that majority of patients (50.6%) were well differentiated (grade I) squamous oral cell carcinoma followed by moderately

differentiated (grade II-26.5%) and poorly differentiated squamous cell carcinoma (SCC) (grade III-22.9%). Moreover majority of the infected population was associated with grade I and it is an agreement with other published reports that large numbers of the patients were associated with grade I as compared to other grades II, III, IV (Paymaster, 1956; Srivastava and Sharma, 1968; Elwood *et al.*, 1984; Son and Kapp, 1985).

Table 11. Occupation wise distribution of oral cancers.

| Occupation | Number of Patients | Tongue Cancer Patients | Lip Cancer Patients | Proportion rate % |
|------------|--------------------|------------------------|---------------------|-------------------|
| Farmer | 12 | 6 (16.21%) | 6 (15.00%) | 15.58% |
| Labor | 5 | 1 (2.71%) | 4 (10.00%) | 6.50% |
| House Wife | 22 | 13 (35.13%) | 9 (22.50%) | 28.57% |
| Teacher | 0 | 0 (0.00%) | 0 (0.00%) | 0.00% |
| Student | 3 | 2 (5.40%) | 1 (2.50%) | 4.00% |
| Jobless | 4 | 1 (2.71%) | 3 (7.50%) | 5.20% |
| Other | 31 | 14 (37.84%) | 17 (42.50%) | 40.25% |
| Total | 77 | 37 | 40 | 100.00% |

In the present study, highest incidence of the oral cancer was at the age of 50-60 and 60-70 years which is in agreement with the findings of Silverman (1990), Brandizzi *et al.* (2008) and Laramore *et al.* (1992).

In the present study, oral cancer patients under treatment of radio therapy were 40 (51.95%), radio-

chemo therapy 25 (32.47%), radio-surgical therapy 2 (2.60%) and no patients under surgical therapy. Our study is not in agreement with the findings of Stanko *et al.* (2007) who found that most of the oral cancer patients receive radio therapy 217 (34.89%), radio surgical therapy 191 (30.70%), radio chemo therapy 89 (14.31%) or surgical therapy 29 (4.66%).

Table 12. Incidence of oral cancer according to marital status.

| Marital Status | Number of Patients | Male | Female | Proportion rate % |
|----------------|--------------------|-------------|--------------|-------------------|
| Married | 73 | 47 (92.16%) | 26 (100.00%) | 94.81% |
| Unmarried | 4 | 4 (7.00%) | 0 (0.00%) | 5.19% |

The present data analysis indicated that oral malignance rate was high in married (60%) people of both sexes and is in agreement with the findings of Jagannatha (2005), Ko *et al.* (1995), Andre *et al.* (1995) and Franco *et al.* (1989).

Recommendations

To educate and inform the people about the substances related to risk factors causing oral cancer. The approach of preventive education is required for the reduction in the incidence of oral cancer specifically in Pakistan, and worldwide. All governmental and non-governmental health organizations should give priority to reduce the oral cancer. To aware the general public about the causes and consequences of oral cancer and to change their life style and literacy level.

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