Original Article

Epidemiological Study of Oral and Perioral Cancers in Isfahan

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ABSTRACT

Introduction: Despite the fact that oral and perioral cancers are not included in common cancers, they are of special importance for their impact on human morbidity and life quality. Awareness of the epidemiological characteristics of oral cancers allows for enhanced planning of timely and effective treatment in order to improve patients' life quality. The objective of the present study was to investigate the distributional patterns of oral and perioral malignancies in terms of age, gender, type, and location.

Methods and Materials: 4553 oral biopsy specimens taken over 17 years (1988-2004) at the Department of Oral and Maxillo-Facial Pathology, Faculty of Dentistry, Isfahan University of Medical Sciences, were studied. Among these, 283 cases included oral malignant lesions. The age, gender, location, and type of malignancy data for these cases were recorded.

Results: The results of this survey showed that commoner malignant oral lesions were epithelial lesions with 175 cases (62%), salivary lesions with 48 cases (17%), and hematogenic malignancies with 23 cases (9%). Squamous cell carcinoma, mucoepidermoid carcinoma, lymphoma, and osteosarcoma were the commoner malignant lesions in this area of the body. The mean age of patients was 52.2 years of old and the male to female ratio was found to be 1.3.

Discussion: The present study showed that compared to the less common malignant lesions, the more common ones, i.e. epithelial and salivary lesions, show far more differences from those reported in previous studies. For example, compared to previous studies, the mean age for epithelial lesions was found to be less by one decade while the mean age for salivary gland lesions was found to be higher by one decade. Squamous cell carcinoma (SCC) was found to be the most common malignancy but its relative frequency was lower than that reported in previous studies. Moreover, differences were also observed in its anatomical distribution. Lip, salivary gland, and maxillary malignant lesions were less common than expected, which is probably due to their extra oral clinical characteristics. The results of the present study also showed that lesions with relatively lower frequencies are more similar to those reported in previous studies.

Key Words: Oral Cancer, Epidemiological Characteristics.

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Introduction

Cancer accounts for a large group of diseases with high morbidity [1]. From every three Americans, one contracts cancer of one type or more during his lifetime. Despite the various and new methods of treatment developed every year, only 54% of the patients survive the disease [2]. Cancer has been identified as the most common cause of

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death in the age group below 65 and the second most common in the age group above 65 [1]. It is also the cause of over 20% of the mortality rate in human societies. Compared to previous years, the cancer-caused mortality has considerably risen in recent years [2]. A second important observation is that cancer and its epidemiology are affected by many factors such as age, gender, race, geographical location, etc. Hence, distribution and epidemiology of cancer varies from place to place. This variation is even observed in the types of cancer commonly found in various geographical locations. For instance, oral cancer accounts for only 3% of all cancers encountered in the United States while in India, it is the most common type of cancer accounting for around 50% of the cases [3].

Although oral cancers account for 3% of all reported cancer cases, the survival rate of mouth and epiglottis cancers has remained awfully low, despite all advances made so far in diagnosis and treatment of malignancies [3]. Oral cancer is now one of the 10 major causes of deaths across the globe, which is a high rate because of its rather low cases [4].

In previous studies, the survey by the American National Cancer's data endorses the results reported in the literature [5]. However, studies carried out in other parts of the world including Iran reveal a different picture. In addition, it is found that frequency distribution of cancer types follow different patterns among different nations and different communities [3]. These differences call for independent studies to be carried out for each part of the world and even for each locality in a single country.

Idris et al (1995) surveyed oral cancers in Sudan and found that squamous cell carcinoma (66.5%) was the commonest malignant lesion. They also found that its prevalence was higher in men rather than in women (M/F>1) [6].

Skinner et al (1985) studied oral malignancies in the United States. They found that 2 out of every 100 biopsy specimens had been reported as malignant lesions. The male to female ratio was found to be 1 and lesions were common in the 5th and 6th decades of life [7].

Among the studies carried out in Iran, Bayat (1999) surveyed 432 cases of oral cancer in Tehran. Squamous cell carcinoma (85%), adenoid cystic carcinoma (2%), and mucoepidermoid carcinoma (2%) were the common lesions [8].

In another study in Isfahan, Tabesh (1995) surveyed 259 oral and perioral cancer cases and found squamous cell carcinoma (73.3%), basal cell carcinoma (16.2%), and adenoid cystic carcinoma (1.9%) as the common types of malignancies [9].

Ghabanchi in Shiraz (2004) surveyed 496 cases of head and neck cancer. Commonest malignancy was found to be squamous cell carcinoma (SCC). The mean age of the patients was 46 with a male to female ratio of 1.7 (M/F=1.7) [10].

Prevention has been recognized as a drastically effective strategy in controlling cancer [11].

Clinicians' awareness of the frequency rates, age and gender distribution patterns, and of the commoner areas of oral malignancies will enhance their capability of accurate examination and timely diagnosis in order to prevent lesion progress and their subsequent metastasis into lymph nodes or remote metastasis which will only complicate treatment.

Methods and Materials

This is a retrospective, descriptive, case-control study using the census methodology and existing data. To gather the required data, the records in the Department of Oral and Maxillo-Facial Pathology, Faculty of Dentistry, Isfahan University of Medical Sciences were used. For this purpose, all of the 4553 records related to biopsies of oral lesions available at the Department since its establishment in 1988 to the end of 2004 were reviewed to select any records indicating a malignancy. The data of these records including record No., patient's age and sex, lesion area, and type of malignancy were extracted from the archives for later refer-

ence. Considerable care was used in collecting the data and thus very profuse data were collected. In the next stage, the lesions were classified in terms of their malignancy into the six categories of epithelial, salivary, soft tissue, hematogenic, osteogenic, and odontogenic lesions [2]. According to the common classification for squamous cell carcinoma, the areas of lesions were grouped as under lip, tongue, mouth floor, buccal mucosa, gingiva, and palate. The remaining cases were classified as mandibular, maxillary, or perioral cases [3]. Redundant or inadequate data were discarded.

Results

A total number of 4553 records of biopsy specimens of oral lesions were studied in the present study which included 283 specimens of oral malignancies (approximately 6 out of every 100 cases).

Among the malignant cases, epithelial lesions with 175 cases (62%) were recognized as the commonest malignancies. Salivary lesions with 48 cases (17%) and hematogenic lesions with 23 cases (9%) followed epithelial ones in rank. Bone lesions (17 cases, 6%), soft tissue lesions (7 cases, 2.5%), and odontogenic lesions (3 cases, 1%) were among the less common malignancies. There were also 10 cases identified as malignant which did not fit into any of these classifications (Diagram 1).

Out of the 283 patients, 160 (57%) were men while 123 (43%) were women; in other words, the male-to-female ratio (M/F) was 1.3 (Table 2). However, the male-to-female ratio showed differences in the different categories of lesions. The highest male-to-female ratio belonged to the soft tissue lesion category (M/F=2.5). In other lesion categories, this ratio varied from 1 to 2 (1<M/F<2). Only in the case of salivary lesions, females outnumbered males (M/F=0.8) (Table 1).

The mean age of the patients was 52.2 years of old, where males and females mean ages were 49.9 and 56.6, respectively. The mean age also varied in lesion categories. The lowest mean age belonged to the soft tissue category (18.3) while the highest one belonged to the epithelial category (57). The mean age in the epithelial lesions category was higher than the overall mean age while it was lower than the overall mean age for other categories. The mean age for the salivary category was near the overall mean (51.9 years of old).

With regard to lesion area, mandibular gingiva, mandibular bone, maxillary gingiva, and palate accounted for 18%, 12.7%, 12.7%, and 11.4% of more involved areas, respectively. Overall, more than half of the malignancies had occurred in one of these four areas, while the rest of the cases were scattered across the other 8 anatomical areas (Diagram 2).

Different lesion categories varied in terms of their most commonly lesion occurring areas. In some cases, it was not possible to assign any specific area to a type of lesion, mainly because of the few reported cases (Table 3).

Table 1. Frequency distribution of malignant lesions based on sex and age.

Malignancy	Frequency and Percentag (%)	Male	Female	M/f ratio	Mean age (years)	Mean age according to gender (years)	
						Male	Female
Epithelial	(62) 175	104	71	1.5	57	57.9	56
Salivary	(17) 48	21	27	0.8	51.9	49.6	53.7
Soft Tissue	(2.5) 7	5	2	2.5	18.3	14.8	27
Hematogenic	(8) 23	14	9	1.6	36.2	25.9	51
Osteogenic	(6) 17	9	8	1.1	31.9	63.3	27
Odontogenic	(1) 3	2	1	2	31.3	24	46
Unknown Source	(3.5) 10	5	5	1	33.6	27	56.5
Total	(100) 283	160	123	1.3	52.2	49.9	52.6

Table 2. Frequency distribution of malignant lesions based on anatomic areas.

Malignancy		Mandibular gingiva	Maxillary gingiva	Mandibular bone	Maxillary bone	palate	Tongue	Buccal mucosa	Mouth floor	Perioral	Lower lip	Upper lip	Maxillary Sinus	Unknown
Epithelial		43	29	10	7	11	33	20	17	9	7	2	2	1
Salivary		3	7	6	2	17	-	3	4	3	1	1	3	-
Soft tissue		-	1	2	1	-	-	1	-	-	-	1	-	1
Hematogenic		4	-	11	4	5	-	1	-	-	-	-	-	-
Osteogenic		2	2	7	3	1	-	-	1	-	1	-	-	1
Odontogenic		1	-	1	1	-	-	1	1	-	1	-	-	-
Unknown source		2	-	2	1	1	-	2	-	-	-	-	-	2
	Frequency	55	39	39	19	35	33	28	23	12	10	4	5	6
Total	Percentage	18	12.7	12.7	6.1	11.4	10.7	9	7.5	3.9	3.2	1.3	1.6	1.9

Table 3.Frequency distribution of malignant lesions based on incidence.

Lesion	Frequency	Percentage
Squamous cell carcinoma (SCC)	154	54.5
Mucoepidermoid carcinoma	29	10.2
Lymphoma	18	6.4
Osteosarcoma	13	4.6
Verrucous carcinoma	11	3.9
Adenoid cystic carcinoma	10	3.5
(Salivary) Adenocarcinoma	4	1.4
Basal cell carcinoma (BCC)	4	1.4
Undifferentiated carcinoma	4	1.4
Chondrosarcoma	4	1.4
Fibrosarcoma	4	1.4
Leukemia	3	1
Polymorphous low grade adenocarcinoma	3	1
Polymorphous malignant adenocarcinoma	2	0.7
Rhabdomyosarcoma	2	0.7
Plasma cell myeloma	2	0.7
Ameloblastic carcinoma	2	0.7
Malignant melanoma	1	0.4
(Metastatic) Adenocarcinoma	1	0.4
Neurogenic sarcoma	1	0.4
Malignancy in calcifying odontogenic cysts (COC)	1	0.4
Unknown source malignancy	10	3.5
Total	283	100

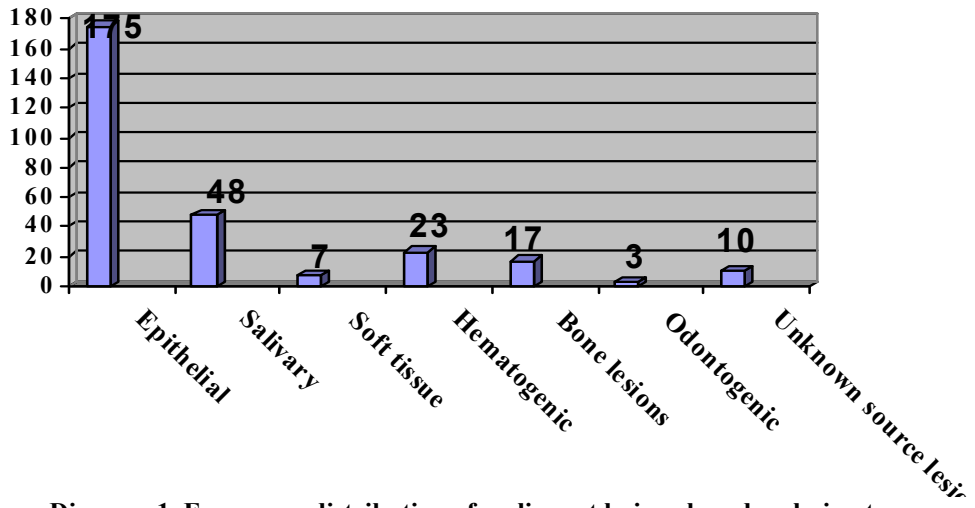

Diagram 1. Frequency distribution of malignant lesions based on lesion type.

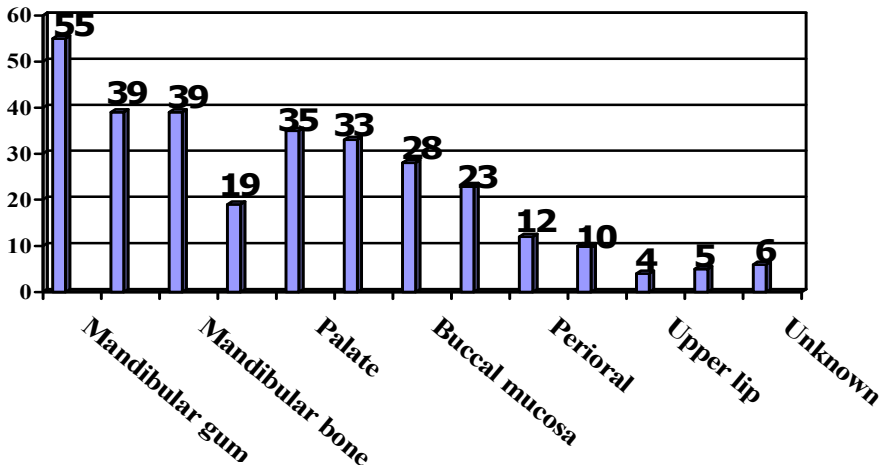

Diagram 2.Frequency distribution of malignant lesions based on affected area.

Discussion

As pointed out before, from the 4553 oral biopsy specimens, 283 cases, or 6 out of every 100, had been reported as malignant. In a similar study by Skinner et al on 10414 specimens, 2 out of every 100 had been reported as malignant [7].

As a possible justification for this apparent difference, one may claim that sampling of suspicious lesions is commoner in developed countries than in other parts of the world. This is while only very serious lesions are sampled in Iran. Thus, biopsy specimens in Iran do not normally serve an early diagnosis or detection purpose but are merely used to confirm malignant lesions. Consequently, the number of malignancies among the biopsy specimens considered in the present study is three times higher, compared to those in similar studies in US.

The commoner malignancies found in the present study were epithelial (62%), salivary (17%), hematogenic (9%), osteogenic (6%), soft tissue (2.5%), and odontogenic (1%) malignancies. In a study on oral cancer in Sudan, Idris et al found commoner lesions to

be SCC (66.5%), salivary (14.7%), non epithelial-non odontogenic (9.6%), and odontogenic (8.6%) malignancies [6]. The relative frequencies of the malignancies found in Idris et al study are similar to those in the present study. Non epithelial-non odontogenic lesions in the present study include the three groups of hematogenic, osteogenic, and soft tissue lesions, all accounting for 17.5% of the malignancies which show a higher frequency than the one in Idris et al study. However, the odontogenic malignancies in the present study account for only 1% of the total malignancies. Since the number of odontogenic lesions found in the present study agrees well with global statistical observations, it may be necessary to study the reason for the rather high cases in Sudan.

The results of previous studies carried out in Iran, however, show differences from those reported here. Bayat [8] found epithelial lesions to account for 91%, salivary lesions for 8%, and soft tissue lesions for less than 1% of the malignancies in his population. Despite the fact that osteogenic malignancies had been considered in his study, no malignancies were reported of such rather common types. Tabesh [9] studied oral and perioral cancers in Isfahan. His findings are very similar to those reported in the present study and include epithelial as 93%, salivary as 4.5%, hematogenic as 1.5%, and soft tissue lesions as 1%.

The male-to-female ratio in the present study was 1.3 (M/F=1.3). In Idris et al study [6], this ratio was reported to be 1, as in Skinner et al study [7]. In Funk et al investigation [5] this ratio was found to be 1.5 and finally, in Okura et al study [12] this ratio was reported to be 1.7. It can be seen that in all studies done outside Iran, the male-to-female ratio ranges between 1 to 2 (1<M/F<2), which agrees well with the findings of the present study. However, other studies carried out in Iran do not exactly match our findings. Bayat [8] found an M/F ratio of 4 to 1 and Tabesh [9] also found an M/F ratio of 2.4, which is evidently higher than our finding. Three reasons may be claimed to explain these differences: 1) in the present study, the presence of rather high number of soft tissue malignancies which mostly occur in women may have led to a lower ratio in our study; 2) in previous studies, the presence of rather high numbers of lip SCC and Basal cell carcinoma (mostly occurring in men) may have led to higher M/F ratios; and 3) women were underrepresented in the two previous studies due to feminine fear of referring to cancer centers as these studies were both carried out in cancer centers (Me'raj hospital in Tehran and Sayyed-o-shohada (p.b.u.h.) hospital in Isfahan).

Mean age for all oral and perioral malignancies were 52.2 in the present study. Skinner et al [7] reported their patients to be in their fifth and sixth decades of life. Funk et al [5] in their study on oral cancer reported a mean age of 64. However, Bayat [8] reported a mean age of 56.3, which is very close to our study findings. It seems, therefore, that the mean age of oral malignancies in central Iran should be 10 years lower than that in the US. Funk et al [5] reported that non-SCC lesions were commoner in younger patients. This is also confirmed by the present study where the mean age of all malignancy categories were less than the overall mean except for epithelial malignancies (Table 1).

The commoner anatomical regions for all types of malignancies in the present study included gingiva (30.7%), mandibular stone (12.7%), palate (11.4%), tongue (10.7%), buccal mucosa (9%), and floor of the mouth (7.5%). Babazadeh et al [11] studied different types of cancer at Oncology Center in Isfahan. They found tongue to be the commonest region for head and neck cancers, accounting for 13.3% of the cases. Skinner et al [7] found the floor of the mouth to be the commonest region for cancer in US. Frequency distribution of the cancer regions, as reported by Bayat [8] and Tabesh [9], are in sharp contrast to the findings of the present study.

The commoner lesions found by the present study are squamous cell carcinoma (54.5%), mucoepidermoid carcinoma (10.2%), lymphoma (6.4%), osteosarcoma

(4.6%), verrucous carcinoma (3.9%), adenoid cystic carcinoma (3.5%), and adenocarcinoma (1.4%).

In all previous studies, SCC had been found to be the most common malignant lesion with different relative frequencies. Bayat [8] and Tabesh [9] found SCC to account for 85% and 73.3% of malignancies, respectively. This is while SCC was found as 85.3% of malignancies in Funk et al [5] and 66.5% in Idris et al studies [6]. Some discrepancies are observed among the findings of present study and previous studies carried out in Iran. Bayat [8] reported the next common types of cancers as follows: adenoid cystic carcinoma (4%), mucoepidermoid carcinoma (2%), and adenocarcinoma (1%).

In Tabesh study [9], basal cell carcinoma (16.2%), adenoid cystic carcinoma (1.9%), and lymphoma (1.5%) ranked as second to fourth as the next common oral cancers, where mucoepidermoid carcinoma (1.1%) follows them.

As previous studies had been carried out in Isfahan and Tehran and the present study has been carried out in Isfahan, geographical location does not seem to cause the found differences; However, the time interval between the previous studies (both 1980-1992) and the present one (1988-2004) may account for the differences as the frequency distributions of different oral cancers may have changed over the recent decade. One reason may be that the two previous studies were carried out during the Iran-Iraq war which had its own effects which are absent at the present; as the role of stress is well established in development and contraction of SCC.

Generally speaking, the present study of common lesions shows differences from the previous studies. Epithelial lesions take place in life one decade earlier than they used to. Although squamous cell carcinoma was found to be the most frequent malignant lesion in present study, as was in previous studies, its relative frequency is lower than them.

Anatomic distribution of oral cancers was also shown to be different in the present study, comparing to previous studies. The higher incidence of gingival cancers reported in the present study is probably due to the fact that the present study was carried out in the Faculty of Dentistry, where dental care and medicine are the main activities. The differences between the incidences of cancers of buccal mucosa and floor of the mouth in Iran and other countries may be attributed to different life styles including smoking and drinking, which are commoner outside Iran.

In conclusion, it may be suggested that Cancer Registries should be established around the country, based on country divisions. It is further suggested that all health and medical personnel at whatever rank should be legal bound to report and refer all cases of oral cancer to the cancer registries so that comprehensive national surveys become possible in order to determine the epidemiological characteristics of cancer in Iran.

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