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Original Article

Epidemiological aspects of head and neck cancers in a population of south east region of Iran

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Abstract

Introduction: The geographical distribution of head and neck cancer shows considerable variation and it is site dependent. The review of the literature shows few data concerning the head and neck cancer patterns in Iran. The purpose of this study was to represent epidemiological aspects of head and neck cancers in south east of Iran.

Materials &Methods: In this retrospective study, from a total of 924 diagnosed patients with cancer in the pathology department of dentistry school archives and two main hospitals in south east of Iran during 2006-2012, 287 cases of head and neck cancer were diagnosed histopathologically. Demographic data of patients such as age, gender, location and type of cancer (carcinoma, sarcoma, melanoma, metastatic, or primary) were obtained from patients' records. Data were analyzed by SPSS statistical software (V.21) using the chi-square test.

Results: Squamous cell carcinoma (39.7%) and basal cell carcinoma (26.8%) were the most common malignancies in the head and neck region. The mean age of the patients was 56.1±12.8 years and the relationship between age groups and head and neck cancers was not statistically significant (P=0.085). Male to female ratio was 0.9 to 1. The relationship between gender and types of head and neck cancers was not statistically significant. (P=0.114)

Conclusion: In this study, prevalence of head and neck cancer in south east of Iran (Zahedan) was relatively high. However, comparison between findings of our study with other studies shows a relation consistency.

Keywords: Basal cell carcinoma, Head and neck neoplasms, Oral cavity, Squamous cell carcinoma

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جنبه های اپیدمیولوژیک سرطانهای ناحیه سر و گردن در جمعیتی از جنوب شرق ایران

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چکیده

مقدمه: توزیع جغرافیایی سرطان سروگردن تنوع قابل توجهی را نشان میدهد و این توزیع وابسته به مکان است. اطلاعات کمی در مورد الگوهای سرطان سروگردن در ایران وجود دارد. هدف از این مطالعه بررسی اپیدمیولوژی سرطان سروگردن در جنوب شرق ایران ود.

مواد و روش ها: در این مطالعه گذشته نگر، از کل ۹۲۴ نمونه با تشخیص بدخیمی که در بایگانی بخش پاتولوژی دانشکده دندانپزشکی و دو بیمارستان اصلی شهر زاهدان درطی سالهای ۹۱-۱۳۸۶ موجود بودند، تعداد ۲۸۷ مورد بدخیمی مربوط به ناحیه سر و گردن یافت شد. نوع ضایعات و اطلاعات دموگرافیک بیماران نظیر سن، جنس و محل و نوع بدخیمی از پرونده بیماران استخراج شد. سپس داده ها با استفاده از نرم افزار آماری SPSS (V.21) و آزمون آماریchi-square تجزیه و تحلیل شدند.

یافته ها: اسکواموس سل کارسینوما (۳۹/۷٪) و بازال سل کارسینوما (۲۶/۸٪) شایع ترین ضایعات بدخیم ناحیه سر وگردن بودند. میانگین سنی بیماران ۱۲/۸±۵۶/۱ سال بود ولی بین گروههای سنی و انواع بدخیمی های سر و گردن ارتباط آماری معناداری وجود نداشت (p=0.085) نسبت مرد به زن۰/۹ به ۱ بود. بین جنس و انواع بدخیمی های سر وگردن نیز ارتباط آماری معناداری وجود نداشت (p=0.114).

نتیجه گیری: براساس مطالعه حاضر فراوانی بدخیمی های ناحیه سر و گردن در جنوب شرق ایران (شهر زاهدان) نسبتاً بالا بود. مشابهت هایی در مقایسه یافته های مطالعه ما با سایر مطالعات وجود داشت.

واژگان کلیدی: کارسینوم سلول بازال، بدخیمی های سر وگردن، حفره دهان، کارسینوم سلول سنگفرشی

Introduction

Head and neck cancer is a general term used for describing malignant tumors of the upper section of the digestive tract. This anatomical region includes the oral cavity, pharynx and larynx.[1] Five percent of all cancers occur in the head and neck region including approximately 40% in the oral cavity, 25% in the larynx, 15% in the pharynx and the remaining in other places such as salivary glands and thyroid gland.[1] These cancers have a different biological behavior pattern and there is a relation between the risk of the cancer with the consumption of tobacco and alcohol. Other factors associated with the cancers of the head and neck region can include genetic factors, nutritional deficiencies and infections by oncogenic viruses.[2, 3] The head and neck cancer, which is the 7th most common malignancy worldwide, is a major global health problem with more than half million new cases each year.[2, 4, 5] Worldwide, almost 600,000 cases of this type of cancer occur in men and 270,000 cases in women, annually.[6] This type of cancer is one of the major causes of death in the world.[7] The geographical distribution of the cancers of the head and neck region shows considerable variation depending on the site.[2] For example in North America and Europe usually head and neck tumors occur in the oral cavity, larynx and oropharynx. While in the Mediterranean countries and the Middle East, nasopharynx cancers are the most common tumors. In South East China and Taiwan, nasopharyngeal cancer is the most common cause of death in young men.[6] A review of the literature shows that there is a lack of information about the patterns of head and neck cancers in Iran.[6] According to the data released by the Iranian Ministry of Health in 2003, the percentage of the oral cancer was highest in Sistan and Baluchestan province (south east of Iran) (9.5%) and it is the only province in which the oral cancer is one of the ten most prevalent cancers in both genders which can be attributed to the consumption of the Paan in this region.[8]

According to the role of the environmental and climatic conditions in cancers, epidemiological studies are needed for validation. The purpose of this study was to represent epidemiological aspects of the head and neck cancers in Zahedan, Iran.

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Materials and Methods

A retrospective study was carried out on the registered pathology records in the pathology department of the Khatamalanbia hospital, Taamin-Ejtemaee hospital and Dentistry School of Zahedan University of Medical Sciences between years 2006 to 2012. A total number of 924 cases of cancer were diagnosed histopathologically among the samples. We classified head and neck cancer into 10 anatomic sites (4) (table 1). However, we excluded neoplasms of the eye and central nervous system. Some clinical information such as gender, age, primary tumor site and type of cancer (carcinoma, sarcoma, melanoma, metastatic, or primary) were obtained from medical records. The cases with incomplete demographic information and the cases which its histopathological diagnosis could not be verified were excluded from the study.

Data were analyzed using SPSS software Version 21(SPSS Inc, Chicago, IL) with descriptive statistics and Chi- Square test. P-values less than 0.05 were considered statistically significant.

Table 1. Definitions of sites of the head and neck cancer (4)

Sites	Structures or locations	ICD-0-3 Codes
Oral Cavity	Lip, tongue, floor of mouth, gum, hard palate, buccal mucosa, vestibule	0-9,20-29,30-39,40-50,60-69,142
Oropharyngeal mucosa	Base of tongue, tonsil, retromolartrigone, soft palate, oropharynx, pharynx, pharyngoepiglotic folds, glossoepiglottic folds, vallecula, lingual surface of theepiglottis, hypopharynx, overlapping lesions of mouth	19,90-99,51-59,100109,140,148, 129-139
Nose	Nasal cavity, Nasopharynx	110-119,300
Paranasal sinuses	Maxillary, frontal, ethmoid, sphenoid sinuses	310-319
Larynx	Laryngeal cartilage, supraglottis, glottis,subglottis,trachea above bifurcation	320-329,339
Thyroid	Thyroid gland	739
Lymph node	Head and neck lymph nodes	770
Salivary	Parotid gland, submandibular gland, sublingual gland, other minor salivary glands	79-89
Bone	Clavarium, temporal bone, facial bones, temporomandibular joints, mandible	410-411
Skin	Skin, lip, eyelid, external ear, face, scalp, neck	440-444
Soft tissue	Connective/subcutaneous tissue of the head and neck, peripheral nerves, autonomic nerves	470,490,754

Results

In this study, there were approximately 287(31.1%) new cases of head and neck cancers. Of 287 patients, 135 (47%) were men with a mean age of 55.8±13.4 years and 152 (53%) were women with a mean age of 56.9±12.5 years and male to female ratio was 0.9 to 1. Epithelial malignancies constituted 79.2% of head and neck cancers, followed by lymphoma (10 %) and metastatic cancers (6.6%), while sarcoma and melanoma constituted 3.2% and 1% of all head and neck malignancies respectively. Figure 1 shows distribution of head and neck cancers' histopathology. There were a predominance of squamous cell carcinomas (SCC) and basal cell carcinoma (BCC) which was present in 39.7% and 26.8% of cases, respectively. The least common of histopathological types of head and neck cancers were osteosarcoma (0.03%) and chondrosarcoma (0.03%). Most common cancers in oral cavity were SCC (82.5%) and verrucous carcinoma (VC) (9.5%), respectively and for the skin it was BCC (69.4%). The five most common sites of involvement were the skin of the head and neck region (38.7%), oral cavity (22%), lymph nodes of the head and neck (11.1%), larynx (10%), thyroid (4.9%), while paranasal sinuses were the least common sites (2.1%). In our study, the most common sites of oral cavity were the buccal mucosa (17.5%) and lip (12.7%), respectively. Of the 19 cases of metastatic cancers, 18 cases were found in the head and neck lymph nodes and one case was in the oral cavity (table 2). Most cases of head and neck cancer were in the age group of41-60 (fifties and sixties) and the age group under 20 had the minimum number. The mean age of patients with carcinoma, sarcoma, lymphoma, metastatic cancers and melanoma were 61.2±12.5, 58.4±14.9, 61.4±9.7, 60.2±10.5 and 57.8±13.5 respectively but the

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relationship between age group and head and neck cancers was not statistically significant (P=0.085). Table 3 shows the common age groups of these cancers. Table 4 shows distribution of head and neck cancers by gender. Head and neck cancers were more prevalent in women (53%) than men (47%). However the most common malignancy in the head and neck (SCC), with a frequency of 61 cases (53.5%), was more common in men. There was a male predominance for sarcomas. All of the cases of melanoma were found in the male gender and metastatic cancers showed a slight female predominance. The relationship between gender and head and neck cancers was not statistically significant (P= 0.114).

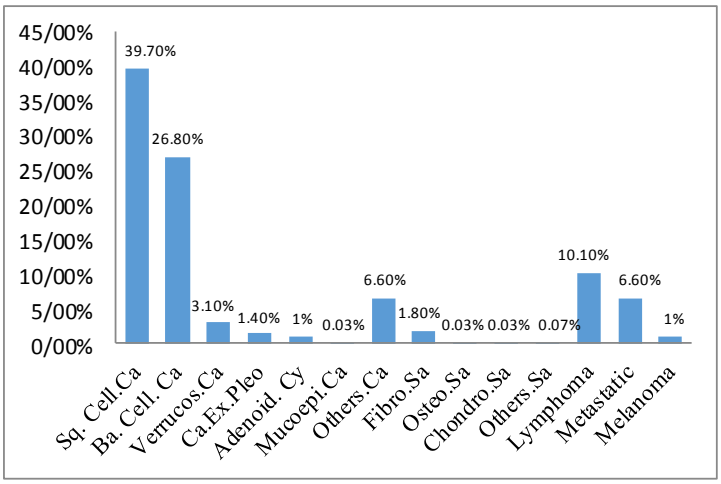


Figure 1. Frequency of head and neck cancers according to histopathologies

Sq.Cell. Ca: Squamous Cell carcinoma, Ba. Cell. Ca: Basal Cell Carcinoma, Verrucous. Ca: Verrucous Carcinoma, Ca. Ex. Pleo: Carcinoma Expleomorphic adenoma, Adenoid. Cy: Adenoid Cystic Carcinoma, Mucoepi. Ca: Mucoepidermoid Carcinoma, Others. Ca: Others Carcinoma, Fibro.Sa: Fibrosarcoma, Osteo.Sa: Osteosarcoma, Chondro.Sa: Chondrosarcoma, Others.Sa: Others sarcoma.

Table 2. Distribution of head and neck cancer histopathologies for each site

Site	Histopathological types Number						Total percentage
Skin	Ba. Cell. Ca 77	Sq.Cell. Ca 28	Melanoma 2	Lymphoma 2	Verrucous. Ca 1	Others .Ca 1	38.7%
Oral Cavity	Sq.Cell. Ca 52	Verrucous. Ca 6	Adenoid. Cy 1	OsteoSa 1	Chondro Sa 1	Lymphoma 1	Metastatic 1	22%
Lymph Nodes	Metastatic 18	Lymphoma 14					11.1%
Larynx	Sq.Cell. Ca 26	Verrucous. Ca 2	Others .Ca 1				10. %
Oropharynx	Lymphoma 5	Sq.Cell. Ca 3					2.8%
Nasopharynx	Sq.Cell. Ca 3	Others .Ca 3	Lymphoma 2				2.8
Thyroid	Papillary 8	Follicular 3	Medullary 2	Others .Ca 1			4.9%
Soft Tissue	Fibro Sa 5	Others Sa 2					2.5%
Major Salivary gland	Ca.Ex.Pleo 4	Lymphoma 2	Mucoepi.Ca 1	Adenoid. Cy 1	Sq.Cell. Ca 1		3.1%
Nose &ParanasalSinuses	Lymphoma 3	Adenoid. Cy 1	Sq.Cell. Ca. 1	Melanoma 1			2.1%

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Table 3. Distribution of head and neck cancer by age groups

Histopathological types		Age groups <20	21-40	41-60	>60	Total
Carcinoma	Sq.Cell.Ca	6(5.2)	8(7)	51(44.8)	49(43)	114(100)
	Ba.Cell.Ca	0	7(9.1)	36(46.8)	34(44.1)	77(100)
	Verrucous.Ca	0	1(11.2)	2(22.2)	6(66.6)	9(100)
	Adenoid.Cy	0	1(33.3)	1(33.3)	1(33.4)	3(100)
	Mucoepi.Ca	1(100)	0	0	0	1(100)
	Ca.Ex.Pleo	0	3(75)	1(25)	0	4(100)
	Others.Ca	1(5.3)	7(36.8)	10(52.6)	1(5.3)	19(100)
Sarcoma	Osteo.Sa	0	0	0	1(100)	1(100)
	Chondro.Sa	0	0	1(100)	0	1(100)
	Fibro.Sa	0	1(20)	1(20)	3(60)	5(100)
	Others.Sa	0	0	2(100)	0	2(100)
lymphoma		3(10.3)	8(27.6)	8(27.6)	10(34.5)	29(100)
Melanoma		0	0	1(33.3)	2(66.7)	3(100)
Metastaticcancer		2(10.5)	3(15.8)	11(57.9)	3(15.8)	19(100)
Total		13(4.5)	39(13.6)	125(43.6)	110(38.3)	287(100)

Table 4. Distribution of head and neck cancer by gender

Histopathological types		gender female	male	total
Carcinoma	Sq.Cell.Ca	53(46.5)	61(53.5)	114(100)
	Ba. Cell. Ca	49(63.6)	28(36.4)	77(100)
	Verrucous. Ca	5(55)	4(45)	9(100)
	Adenoid.Cy	1(50)	2(50)	3(100)
	Mucoepi.Ca	1(100)	0	1(100)
	Ca. Ex.Pleo	2(50)	2(50)	4(100)
	Others.Ca	13(68.4)	6(31.6)	19(100)
Sarcoma	Osteo.Sa	0	1(100)	1(100)
	Chondro.Sa	1(100)	0	1(100)
	Fibro.Sa	1(20)	4(80)	5(100)
	Others.Sa	0	2(100)	2(100)
lymphoma		16(55.2)	13(44.8)	29(100)
Melanoma		0	3(100)	3(100)
Metastatic cancer		10(52.6)	9(47.4)	19(100)
Total		152(53)	135(47)	287(100)

Discussion

The incidence of head and neck cancer (HNCA) in different studies was reported from 9.8% to 42.7%.[9] In our study, the prevalence of these lesions was 31.1%. In another study[6] in Iran (Kerman Province), the overall incidence of HNCA had been reported 20.9% which was lower than the result of our study. But in a study in India[10] prevalence of these cancers has been reported 54.4%. The relatively high frequency of HNCA in our study may be due to the cultural similarities with India in oral habits such as smokeless tobacco use. This study showed that the head and neck cancers were more common in skin which were in agreement with Rad et al's study.[6] In Nigeria During the 11 years period, 174 (64.2 %) out of 271 cancers occurred in the skin of the

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head and neck area.[11] But in another study in Iran (Shiraz), skin cancers were the third most common cancers in this area and constituted 7% of the total cases.[12] Comparing to the other body areas, the head and neck region is exposed to the higher actinic exposure which causes the high incidence of skin malignancies in this area (80% of skin cancers).[6]

In two studies in Japan[13]and Malaysia[14], the most common site of the head and neck cancer was the larynx (45.9% and 28.7% respectively).Larynx cancer is the second most common respiratory tract cancer, after lung cancer and its incidence has increased in many parts of the world. [6] This increased incidence rate is probably associated with changes in alcohol and tobacco consumption.[6] Larynx cancer was the fourth most common cancer (10%) in our study.

In the present study, lymph nodes of the head and neck with a frequency of 11.1% were the third most common location of the head and neck cancer. While in another study with 309 patients, lymph nodes have been reported as the second most common location.[6] The mean age of patients with the head and neck cancer in the present study was 56.1±12.8 years. In the studies of Rad[6], Okami[13], kim[15] and Larizadeh[16] the mean age of patients have been reported 53.6, 63.9, 60.3 and53.03 years, respectively. In the present study, 4.5% of malignancies were in patients under 20 years, this was however 3.3% in Olusey's report[17]and less than 1% in Bhattacharjee's study.[10] Most available studies [1,4,6,10,14,15] have demonstrated that the head and neck cancer is more common in men. However in our study, the data obtained from the aforementioned centers slightly presented more tumors in women. Actually in the recent years a significant increase in incidence of the head and neck tumors was observed in women which can be due to the change in habits of smoking and drinking of alcohol by women.[1]

Oral cancer

A significant geographical, ethnical and cultural diversity can be observed in the incidence of oral cancer. This variation is different from a low incidence in Japan (1-2% of all malignant tumors) to over 50% in India.[18]In the present study, oral cavity was the second most common location with 63(22%) cases in the head and neck region similar to the Larizadeh et al.'s study.[16] In another studyin Iran [6], oral cavity and pharynx cancers were reported as the fourth most common location but in Alvarenga et al.'s study[1], the oral cavity cancer, was reported as the most common cancer in the head and neck region. It is well known that the location of the tumor is one of the important factors that could impact the nodal metastasis and affect the survival of the patients.[19] In many studies it has been reported that the tongue is the most common site of occurrence in the oral cavity.[8, 15, 19]However in the present study, the most common sites were the buccal mucosa and lips, respectively. A higher incidence of malignancies in the buccal mucosa could be due to the more common placement of the Paan in this anatomical site by the people of this geographic area.

Oral cancer occurs in men more than women, but this ratio has been reduced from 6 to 1 in 1950 to less than 2 to 1 today.[8]Also in most studies [6,19,20], the incidence of oral cancer has been reported more prevalent in men, contrasting the results of this study, 57% of oral cancers were in women. In agreement with our results, Delavarian *et al* [8] and Gaitan-Cepeda*et al*.[21] reported that the female gender were more dominantly involved. The mean age of the patients with oral cancer in the present study was 55.4± 21.5 and these cancers were found more in the 60 years (44.4%) and 41-60 years (36.5%) age groups. Also Marocchio's study in Brazil[20]showed most patients with oral cancer were in the sixth decade of their lives. This confirms that OSCC (the most common cancer of the oral cavity) often occurs at higher ages. Also the present study, consistent with other studies[1,4, 6, 8, 10, 16, 19], showed that the most common cancer of the oral cavity was squamous cell carcinoma.

Conclusion

According to this study, the prevalence of head and neck cancer in south east of Iran was relatively high. Squamous cell carcinoma and basal cell carcinoma were the most common malignancies in the head and neck region.

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Conflict of interest: There was no conflict of interest.

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