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The frequency of head and neck cancers among samples received by Ali-ibn Abi Talib Hospital Pathology Centre from 2005 to 2016, Rafsanjan, Iran

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Abstract

Background: Head and neck cancer is the sixth most common cancer in the world, with 690,000 new cases identified in 2012. There are some arguments over an increase or a decrease in the incidence rate of head and neck cancers in different locations. This study is conducted aimed at determining the frequency of head and neck cancers in patients referring to Rafsanjan Ali-ibn Abi Talib hospital pathology lab from 2005 to 2016 and comparing frequencies in different years.

Materials and Methods: In this descriptive study, a datasheet was prepared from medical files from 2005 to 2016, containing the date, age, sex, type, and site of tumors in patients admitted to Ali-ibn Abi Talib hospital pathology lab, Rafsanjan, Iran. Data were analyzed using chi-square or Fisher's exact tests.

Results: In this study, 343 cancer cases were obtained from 27414 files (1.25%). Out of these cases, 33.2% (114 cases) and 66.8% (229 cases) occurred in women and men ($P < 0.001$), respectively. The most common site of the tumor was skin, and the most common cancer was basal cell carcinoma. There was no evidence of a significant linear trend for the incidence of malignancies from March 21, 2005 to September 22, 2015.

Conclusions: The present study did not show any significant changes in the frequency of head and neck cancers in different years. We need to study the incidence rates of more prevalent risk factors, such as tobacco and alcohol in these patients simultaneously.

Keywords: Head and Neck, Cancer, Incidence, Epidemiology, Frequency.

Introduction

Head and neck cancer is the sixth most common cancer in the world, with 690,000 new cases identified in 2012, and 375,000 individuals died of head and neck cancers, having been approximately 4.6% of the total mortality of cancers (1); however, head and neck cancer is the third leading cause of deaths in Iran (2). Anatomic sites involved in head and neck cancers include the oral cavity, nose, nasopharynx, oropharynx, hypopharynx, larynx, thyroid, and salivary glands (3).

Alcohol consumption, heavy tobacco smoking, and the special strains of Human Papilloma Virus (HPV) are environmental and lifestyle risk factors known to be closely associated with head and neck cancers (4). Tobacco smoking is the leading preventable cause of morbidity and mortality worldwide. Approximately 5,000,000 deaths occur every year worldwide due to direct tobacco smoking, with the effects of secondhand smoke leading to additional 600,000 deaths. Furthermore, mortalities attributed to tobacco use have been increasing at a higher rate in developing countries, with higher prevalence

rates having been observed among men than women (5).

Squamous cell carcinomas (HNSCC) is the most common type of head and neck cancer (more than 90%) that arises from the mucosal surfaces of the oral cavity (OSCC, ICD-10 code: C00-08), oropharynx (OPSCC, ICD-10 code: C09-10 and C12-14), and larynx (ICD-10 code C32-9)(6). Head and neck cancers have a distinct geographical distribution with this difference being due to the different risk habits of populations (7).

There are some arguments over an increase or a decrease in the incidence rates of head and neck cancers in different locations. To find an answer to such arguments, there is a need for the careful statistical analysis of the incidence rate of head and neck cancers in the Iranian society and comparing it with other regions.

The present study was conducted to determine the incidence rate of head and neck cancers in patients referring to Rafsanjan Ali-ibn Abi Talib hospital pathology lab from 2005 to 2016.

Materials and Methods

This is a descriptive study in which a datasheet, including the date, age, sex, type, and site of the tumor, was prepared from medical files. The data set consisted of patients' information on head and neck cancers, admitted to the Abi Talib hospital pathology lab, Rafsanjan, Iran. The data were extracted from 27414 files of patients from 2005 and 2016. The cases of head and neck sites were identified by the standard 'International Statistical Classification for Diseases', the 10th revision (ICD-10) coding (8).

The ICD-10 coding for head and neck sites is comprised of C00 (lip), C01-06 (oral cavity), C07 (parotid), C09 (tonsil), C10 (oropharynx), C11 (nasopharynx), C12-14 (hypopharynx), C30-31 (nose and paranasal sinus), C32 (larynx), skin C43.0-43.4, C44.0-44.4, and C73 (thyroid glands). Malignancies, including squamous cell carcinoma, melanoma, undifferentiated carcinoma, papillary cell carcinoma, follicular cell carcinoma, mucoepidermoid carcinoma, acinic cell carcinoma, adenoid cystic carcinoma, parathyroid carcinoma, lymphoma, and basosquamous cell carcinoma were studied.

The privacy of patient information was preserved while handling the data set. Data were analyzed using SPSS 15.0. The chi-square test for trend was utilized to assess a linear trend for the incidence of malignancies over the study period. In addition, the significance level was considered at 0.05.

Results

In this study, all cases of head and neck cancers were examined based on the registration data obtained from Ali-ibn Abi Talib hospital pathology lab, with 343 cases extracted from 27,414 files (1.25%). From among these cases of cancers, 33.2% (114 cases) and 66.8% (229 cases) occurred in women and men, respectively, with the difference between males and females having been statistically significant ($P < 0.001$). The total male-to-female ratio was 2.01, and the mean ± standard age of the patients was 63.90± 14.88 years, ranging from 10 to 96 years. The mean ages of the males and females were 64.15± 14.74 years and 63.39± 15.21 years, respectively.

Table 1 shows the frequency distribution of the cases according to the site of the lesion and sex. The difference of thyroid carcinoma between males and females was statistically significant ($P = 0.004$). Out of 144 females, 2 individuals (1.8%) were aged under 30, 41 individuals (36%) from 31 to 60, and 71 individuals (62.3%) over 61.

Table 1: The frequency distribution of head and neck cancers by the site and gender over the period of 2005 to 2016

Sites of head & neck cancers	Females	Males	P-value
Lips	10 (8.8%)	17 (7.4%)	0.662*
Oral cavity	7 (6.1%)	21 (9.2%)	0.334*
Pharynx	2 (1.8%)	8 (3.5%)	0.506#
Larynx	8 (7.0%)	6 (2.6%)	0.079*
Esophagus	3 (2.6%)	14 (6.1%)	0.162*
Nasal cavity	2 (1.8%)	7 (3.1%)	0.723#
Cervical lymph nodes	1 (0.9%)	11 (4.8%)	0.068#
Paranasal sinuses	0 (0%)	1 (0.4%)	0.999#
Salivary glands	1 (0.9%)	5 (2.2%)	0.668#
Thyroid	20 (17.5%)	17 (7.4%)	0.004*€
Parathyroid	1 (0.9%)	1 (0.4%)	0.555#
Skin	59 (51.8%)	121 (52.8%)	0.850*
Total	114 (100%)	229 (100%)	<0.001*€

- Data are expressed as n (%). *The chi-square test or #the Fisher's exact test were used, with €$P < 0.05$ considered statistically significant for both genders.

In the same vein, out of 229 males, 4 individuals (1.7%) were aged under 30, 92 individuals (40.2%) from 31 to 60, and 133 individuals (58.1%) over 61. No statistically significant difference was observed between males and females (P = 0.778).

Six cases of malignant tumors which occurred to individuals aged under 30 included squamous cell carcinoma (two cases), lymphoma (two cases), and papillary thyroid carcinoma (two cases). Basal cell carcinoma and squamous cell carcinoma were the most common and second common cancers in both genders.

Table 2 shows the gender-based frequency of each type of cancer. There was no statistically significant difference between males and females except for papillary thyroid carcinoma having been more prevalent in females (P=0.009), and lymphoma having been more common in men (P=0.034).

Table 2: The frequency of head and neck cancers based on tumor types and gender

Tumor types	Female	Male	P-value
BCC	59 (51.8%)	112 (48.9%)	0.619*
SCC	24 (21.1%)	65 (28.4%)	0.145*
Melanoma	4 (3.5%)	7 (3.1%)	0.999
Undifferentiated carcinoma	2 (1.8%)	5 (2.2%)	0.999#
Papillary cell carcinoma	19 (16.7%)	17 (7.4%)	0.009*
Medullary carcinoma	2 (1.8%)	1 (0.4%)	0.257#
Acinic cell carcinoma	0 (0%)	1 (0.4%)	0.999#
Adenoid cystic carcinoma	2 (1.8%)	5 (2.2%)	0.999#
Parathyroid carcinoma	1 (0.9%)	3 (1.3%)	0.999#
Basosquamous carcinoma	1 (0.9%)	3 (1.3%)	0.999#
Lymphoma	0 (0%)	10 (4.4%)	0.034*€
Total	114 (100%)	229 (100%)	<0.001*€

Data are expressed as n (%). *The chi-square test or #the Fisher's exact test was used, with €P < 0.05 considered statistically significant for both genders.

Table 3 shows the frequency of cancers for each year. According to this table, the highest percentage of malignancies has been related to the period from March 21, 2005 to March 20, 2006, with the lowest percentage of malignancies having been related to the period from March 21, 2009 to March 20, 2010. The chi-square test for trend shows that there is no evidence of a significant linear trend for the frequency of malignancies from March 21, 2005 to September 22, 2015 (P=0.369).

Table 3: The frequency distribution of head and neck cancers over the period of the study (2005-2016)

Variable	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-22 Sep 2015	Total
Cancers	36 1.41%	46 1.35%	40 1.29%	38 1.34%	24 1.01%	27 1.12%	31 1.25%	31 1.40%	29 1.13%	31 1.16%	10 1.23%	343 1.25%
Cases	2523 98.6%	3354 98.6%	3050 98.7%	2805 98.7%	2347 99.0%	2385 98.9%	2448 98.7	2188 98.6%	2534 98.9%	2633 98.8%	804 98.8	27071 98.7%
Total	2559 100%	3400 100%	3090 100%	2843 100%	2371 100%	2412 100%	2479 100%	2219 100%	2563 100%	2664 100%	814 100%	27414 100%

Data were analyzed using the chi-square test for trend, with P=0.369.

Discussion

Facts and figures about the epidemiological characteristics of head and neck cancers are quite different. In the present study, we included the skin cancers of head and neck, with these cancers (for example BCC and SCC) being obviously the most common cancers. Hence, about 52% of the cancers in the present study were skin cancers. In addition, the most common site of involvement was the skin of the head and neck in the southeast of Iran (9). In most articles, skin cancers are not considered in the category of head and neck cancers, so the larynx was reported as the most common site of involvement in Kerman (46.76%) (10); in the same vein, Mafi et al reported laryngeal cancer as the most common type of head and neck cancers in both sexes in Iran (11). In the present study, the second most common site of involvement was thyroid after skin, probably due to the referral of laryngeal cancer to another medical center.

The significant point in the present study was the changes in the frequency of cancers in different years. In addition, the male-to-female ratio was about 2.0, which was rational because the most common tumors in this study were skin tumors, with the major risk factor for these tumors having been sunlight. Furthermore, men are more exposed to

sunlight than women in this region. In Zahedan, Kadeh et al reported that head and neck cancers were more prevalent in woman (53%) than in men (47%), but SCC, being the most common head and neck cancer, was more common in men (9). In the present study, papillary thyroid carcinoma was the only tumor which was more prevalent in women than in men. Based on the cancer registry data, Mirzaei et al reported that the sex ratio was greater in men for various types of head and neck cancers than in women, except for thyroid cancer, from 2003 to 2009 (12).

The present study did not show a significant increase or decrease in the frequency of head and neck cancers from March 21, 2005 to September 22, 2016 in both sexes, but several studies have shown an increase or a decrease in the incidence rate of head and neck cancers; for example, Rama Jayaraj et al (1) demonstrated that the incidence rate of head and neck cancer decreased in the Northern Territory males of Australia but remained unchanged in Australian females; in contrast, Mirzaei et al (12) reported an increasing trend in the age-standardized rate of head and neck cancers in Iran. A study in Denmark reported a marked increase in head and neck cancers, with the highest incidence rate having been reported in patients aged over 60 (13).

Using population–based registry data over the periods of 1983-1987 and 1998-2002, Simard et al reported a change in the incidence rate of head and neck cancers in different countries, perhaps due to the prevalence of different head and neck risk factors. The fixedness of the frequency of head and neck cancers in our patients implied that no change occurred in exposure to carcinogens, such as sun exposure and smoking (14).

Elango et al concluded that the overall incidence rate of head and neck squamous cell carcinoma (HNSCC) decreased, with this could have been due to the decreased prevalence of tobacco use. However, the incidence rate of tongue cancer increased in the present study, implying that factors other than tobacco and alcohol might have played a role in tumorigenesis (7).

Sarcomas is one of the tumors expected to be diagnosed in the head and neck region. In this study, no case of sarcoma was observed, so the measuring of its frequency was not possible. One of the reasons for the low frequency of sarcoma in the region studied is that this cancer is observed in larger areas. Alishahi et al studied 105 patients with head and neck sarcoma in Isfahan, Iran, with the most prevalent cases of sarcomas having been reported to be Osteosarcoma (30.47%), Chondrosarcoma (13.33%), and Ewing sarcoma (10.47%) (15).

Cancer incidence rates are connected with cancer risk factors, with some of the most common risk factors for head and neck cancers being sunlight exposure, cigarette smoking, and alcohol consumption (16); hence, any changes in these habits can change the incidence rates of head and neck cancers in the next decades. One of the major limitations of the present study was that it was conducted on patients referred to a specialized hospital, so the entire population was not considered. Hence, conducting more extensive studies containing all patients with head and neck cancers in the Rafsanjan city could yield better results.

Conclusion

The present study showed no significant increase or decrease in the frequency rates of head and neck cancers over the period of the study. Determining an increase or a decrease in the frequency of head and neck cancers is not easy; thus, to establish a causal relationship, the effects of more prevalent risk factors, such as tobacco and alcohol must be assessed in patients, concurrently.

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