

RESEARCH ARTICLE

Frequency of Head and Neck Squamous Cell Carcinomas and Related Variables in Southern Iran (Ahvaz City): 10-Year Retrospective Study

Sedigheh Bakhtiari¹, Hamed Mortazavi¹, Masoumeh Mehdipour¹, Nahal Jafarian², Nastaran Ranjbari³, Somayeh Rahmani^{1*}

Abstract

Objective: Squamous cell carcinoma (SCC) is a life threatening lesion but there has been only limited research about its frequency in Iran. The aim of this study was to evaluate the frequency of squamous cell carcinoma of the head and neck in the records of the pathology department of Imam Khomeini hospital in Ahvaz between 2005 and 2015. **Methods:** The retrospective and cross-sectional study was conducted using 55,708 medical records of cancer throughout the body, accumulated in the pathology department of Imam Khomeini in Ahvaz in the designated period. Information about age, gender, site of involvement, histological characteristics, status of lymph node metastasis, smoking habit, family history, job and education level was extracted and data were analyzed with the Chi-square test with SPSS version 22. **Result:** Of the total of 55,708 records, 582 patients (1.04%) had head and neck squamous cell carcinomas. The male to female ratio was 2.85. The frequencies in the head, mouth and neck were 28.7%, 22% and 49.3% respectively. Significant relationships between being male and location (neck) ($p = 0.002$), age (60 to 80 years old) and being a farmer ($p = 0.001$) was observed. The most important correlated risk factors were: smoking, sunlight exposure, rural residence, job and education level. **Conclusion:** Head and neck squamous cell carcinomas were found to account for 1.04% of all cancers in Ahvaz, one of the southern provinces of Iran.

Keywords: Squamous cell carcinoma- head- neck- Iran- epidemiology- frequency

Asian Pac J Cancer Prev, **18** (2), 375-379

Introduction

Malignancies or tumors are a large group of human diseases and their prevalence is increasing. Despite existing of numerous advances in cancer treatment field, SCC is one of ten causes of death. Multiple reasons can lead to late diagnosis of SCC, for example it is asymptomatic in early stages, it has similar clinical features with other lesions, in addition it has variety in clinical presentation (Shiva and Mousavi, 2014). SCC is the most common malignancy of the head and neck, especially in older-aged. SCC involves 4 and 2 percent of all cancers in men and women respectively (Mohtasham et al., 2013).

Squamous cell carcinoma (SCC) is the most common malignant neoplasm of the head and neck (Eversole et al., 1997) and SCC is the sixth cancer in men and twelfth in women (Cortan et al., 1999).

Head and Neck Squamous Cell Carcinoma (HNSCC) is one of the most prevalent cancers among the 10 main causes of death in the world (Devadiga and Prasad, 2010). Globally, the majority of malignant neoplasms occur in developing countries (Rawashdeh and Matalka, 2004;

Sirivardena et al., 2006).

Infection with human papilloma virus (HPV), smoking, alcohol consumption, viral infections, genetic factors, immunosuppression, chronic Iron deficiency anemia, sub-mucous fibrosis and environmental factors are proposed risk factors of HNSCC (Sirivardena et al., 2006; Mafi et al., 2012).

Like many carcinomas, the incidence of this kind of cancers increases with age, especially in males and more cases have been reported after age 40 (Ghapanchi et al., 2004). However, in recent years its incidence has been increased in younger age. The incidence in men compared with women decreased, because smoking among women has been increased (Silverman, 2003). The impact of geographic and regional differences in the incidence of oral cancer suggests that cultural styles - Social life has an important role in carcinogenesis in the oral cavity (Iamaroon et al., 2004). This difference in approach can also show the role of deep geographical differences to disease (Chidzonga and Mahomva, 2006). This disease is preventable to some extent and we can delay its occurrence from 5 to 10 years with cut of harmful habits

¹Department of Oral Medicine, School of Dentistry, Shahid Beheshti University of Medical Sciences, ²Dentist, Tehran, ³Department of Pathology, Imam Khomeini Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. *For Correspondence: s.rahmani2011@yahoo.com

(Ariyawardana and Vithanaarachchi, 2005). Despite advances in prevention, diagnosis and treatment, 5 year survival rate of the disease in the last 30 years has not improved (Silverman, 2003). Early diagnosis and timely treatment, improves the prognosis of cancer (Pitiphat et al., 2002).

Findings of researches in national report on cancer registry in Iran showed, Age standardized incidence rate of head and neck cancer was 4.8 cases per 100,000 in 2003 and 7.4 cases per 100,000 in 2009 (Mirzaie et al., 2016). In another study, Shojaie et al (2015) evaluated frequency of head and neck cancer in children and adolescent population in west Iran (Hamadan) from 1989 to 2009. Frequency of carcinoma and SCC was 45.3% and 20% respectively. In Ghapanchi's study (2004) in Iran, 13.5% of referred patients had head and neck malignancies and most prevalent tumor in this region was SCC.

The aim of this study was to evaluate the frequency of head and neck squamous cell carcinoma in Ahvaz, the capital of southern provinces of Iran as one of the largest ethnic diversity in terms of geography and socio-cultural habits which is different to other parts of Iran.

Material and methods

This retrospective and cross - sectional study was done on Archive of medical records of the Department of Pathology Imam Khomeini Hospital in Ahvaz (southern Iran) during 2005 to 2015.

Data was collected through observation and review of records and cases of head and neck squamous cell carcinoma, Diagnosis was confirmed by histopathologic study, data extracting and statistical analysis was performed on them. The information contained in the records include: gender, age, site of involvement, histopathologic characteristics and lymph node metastasis.

Incomplete records were excluded from the study. Information about smoking, family history, job and education level were collected by phone call.

Anatomic locations were divided into 3 sites: head, neck and mouth. Head included scalp, face skin, eye, nose and ear. Mouth included tongue, gum, floor of mouth, and palate. Neck included pharynx, oropharynx (soft palate, posterior one-third (base) of the tongue, the soft palate, posterior pharyngeal wall), larynx and the upper part of the esophagus (Kreimer et al., 2005; Cleveland JL et al., 2011).

In this study, patients were divided into 5 age groups 1-20, 20-40, 40-60, 60-80 and older than 80. Their jobs were classified into 2 groups outdoor and indoor jobs. Education level has been set for the illiterate, elementary, high school, diploma and college education.

Data were analyzed using SPSS software, version 22, indicators of frequency, mean, standard deviation, minimum and maximum requirements for reporting findings were used. The possibilities of a significant relationship between the variables were analyzed with using Chi-square test.

Because of retrospective design of this study and not mentioning the name of patients, there was no ethical consideration.

Results

Of the 55,708 cases of cancer throughout the body in the pathology department of Imam Khomeini Hospital in Ahvaz, 612 cases (1.09 %) were identified with diagnosis of HNSCC and total of 30 cases among those who had deficient in terms of information were excluded. Study on (1.04%) 582 remains the case that a histopathologic diagnosis of head and neck squamous cell carcinoma were done.

Of these cases, 431 were male (74.1 %) and 151 females (25.9 %) and male to female ratio was 2.85. Minimum age was 5 years and maximum 96 years (Standard Deviation \pm 16.33 and Median 63.19). In the age ranges, 60 to 80 years old had the highest frequency of HNSCC.

The greatest number of SCC cases had neck involvement "287 cases (49.3%)", frequency of HNSCC according to location in general classification is available in Table 1.

Figure 1 shows the distribution of HNSCC according to location of involvement. eyes with 43 cases (7.4 %) were the most common sites of involvement in head , lower lip with 60 cases (10.3 %) was the most common sites of involvement in mouth and Larynx with 219 cases (37.6 %) was the most common sites of involvement in neck.

447 cases (76.8 %) were smokers and 112 cases (19.2 %) had a positive familial history of HNSCC. There was not statistically significant relationship between positive familial history and HNSCC. Most of patients were farmer (354 cases (60.8 %)). Most of cases had job outside of home, with 525 cases (90.2 %). Most of them in terms of education level were illiterate persons, with 405 cases (69.9 %).

Histopathologically, greatest number of SCC cases were well differentiated (215 case (36.9%)). 216 (37.1%) cases had invasion to adjacent tissues. There was lymph node involvement in 16 (2.7%) of cases. In 2008 there was

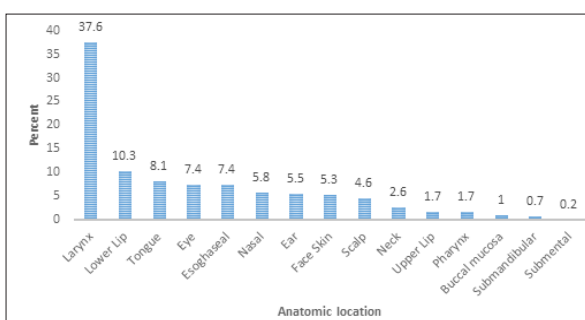


Figure 1. Distribution of HNSCC According to Location of Involvement

Table 1. Distribution of HNSCC with General Classification

Location	Frequency (Percent)
Head	167 (28.7%)
Mouth	128 (22%)
Neck	287 (49.3%)
Total	582 (100%)

Table 2. Distribution of Patients with HNSCC in Terms of Their Gender and Job

Job		Gender		Total
		Male	Female	
Farmer	Count	279	75	354
	% within Job	78.80%	21.20%	100%
Driver	Count	88	10	98
	% within Job	89.80%	10.20%	100%
Nomad	Count	21	7	28
	% within Job	75.00%	25.00%	100%
Housekeeper	Count	1	56	57
	% within Job	1.80%	98.20%	100%
Student	Count	10	3	13
	% within Job	76.90%	23.10%	100%
Worker	Count	32	0	32
	% within Job	100.00%	0.00%	100%
Total	Count	431	151	582
	% within Job	74.10%	25.90%	100%

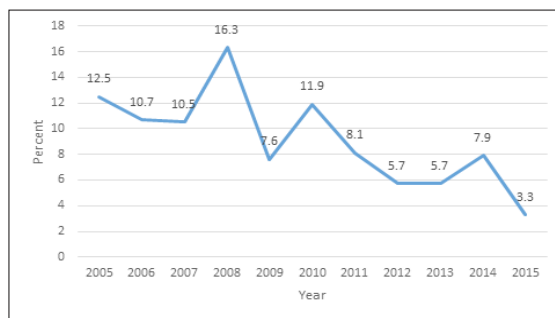


Figure 2. Annual Distribution of HNSCC among 2005 – 2015

the highest incidence of HNSCC. Annual distribution of HNSCC among 2005 – 2015 has been shown in Figure 2.

We found following significant relationships among evaluation of variables: 74.1% of HNSCC patients were men and 25.9% were women. There was statistically

significant tendency for development of HNSCC in men ($p=0.018$). Larynx had more involvement in both genders (chi square test) ($p=0.001$). There was significant relationship among each of head, neck and mouth involvement with 60 to 80 years old age group ($p=0.001$). Chi square test showed a significant relationship between HNSCC patients and their job, more of HNSCC patients were men who their job was farmer ($p=0.001$) (see Table 2). Evaluation of relationship between job of patients and site of SCC involvement (head, neck and mouth) showed that neck region had more frequency of involvement among the farmers ($p=0.001$) (details are available in Table 3). Involvement of neck region in men toward women had statistically significant difference and in men was more ($p=0.002$).

The frequency of HNSCC was more in men farmers with 279 cases (64.7%). The most common site of involvement in them was in neck (191 cases (54)). Most

Table 3. Distribution of Patients with HNSCC in Terms of Location of Involvement and Job

Job		Location			Total
		Head	Mouth	Neck	
Farmer	Count	89	74	191	354
	% within Job	25%	21%	54%	100%
Driver	Count	26	19	53	98
	% within Job	26.50%	19.40%	54.10%	100%
Nomad	Count	11	7	10	28
	% within Job	39.30%	25.00%	35.70%	100%
Housekeeper	Count	19	19	19	57
	% within Job	33.30%	33.30%	33.30%	100%
Student	Count	9	4	0	13
	% within Job	69.20%	30.80%	0.00%	100%
Worker	Count	13	5	14	32
	% within Job	40.60%	15.60%	43.80%	100%
Total	Count	167	128	287	582
	% within Job	28.70%	21.90%	49.40%	100%

of HNSCC patients were rural, 401 cases (68.9%).

Discussion

Of the total number of 55708 patients that have tumors throughout the body, 582 patients (1.4 %) had HNSCC. Of the 582 patients with HNSCC, 431 of them were male and 151 patients were female. Male to female ratio was 2.85. This ratio is similar to most studies in Iran and other countries (Andisheh-Tadmir et al., 2008; Abdulai, Nuamah 2013; Aminzadeh et al., 2013). But in the Sadri's study male to female ratio was almost equal and was different from the present study (Sadri, 2011). The highest incidence of HNSCC in this study ranged from age 60-80 years. The lowest rates were in the range between 1-20 years but in the study of Abdulai (2013) most widely incidence was 5th decade and no case was reported in the first and second decade. In most studies, patients were older than 60 years that are similar to present study (Yaghoobi et al., 2004; Sadri, 2011; Razavi et al., 2012). There was decreasing trend in annual distribution of HNSCC among 2005 to 2015. That's cause can be earlier detection and identifications of cancerous lesions and higher degree of awareness of people about risk factors of cancers raised among these years.

According to this study, the most common site of HNSCC involvement was Larynx with 37.6 percent and it was similar with the study of Aminzadeh et al., (2013). In Novin et al's study (2015), 55% of all primary tumor sites in HNSCC patients was larynx. Histopathologically most common types of HNSCC was well differentiated SCC (36.9 percent) which is consistent with other studies (Yaghoobi et al., 2004 and Agarwal et al., 2011).

In this study, 76.8 percent of HNSCC patients were smoker, cigarette smoke and tobacco have up to 4000 and 60 carcinogenic materials respectively. There are more than 700 additive material (flavoring and preserving products) in cigarette. This is the reason of high incidence of HNSCC in smokers (Bakhtiari et al., 2012).

The highest incidence of HNSCC was seen in farmers (60.8%). Franceschi (1993) in a case-control study about cancer risks in farmers wrote that oral cancer in oral cavity and pharynx is common among farmers. Farmers spend more time outdoors and often expose to sun's ultra violet light therefore the risk of HNSCC is higher in them (Ouyang, 2010). SCC can be more seen in lip region of farmers (Gervasio et al., 2001).

69.6 percent of HNSCC patients in present study were illiterate, illiterate persons have less information about cancer and it's risk factors, which this can be reason of higher prevalence of HNSCC in these patients.

The cause of high prevalence of HNSCC (68.9%) in villagers, is that these patients refer late to medical centers for diagnosis and treatment.

One of limitations of present study was incomplete records, which constrained researcher to exclude them from study. This study was retrospective and there was limitation in access to some information such as risk factors.

Frequency of HNSCC in Ahvaz city (southern Iran) was more in men. Among all anatomic locations larynx

had the most involvement. Greater number of HNSCC patients had 60 to 80 years old and most of them were farmer.

References

- Abdulai AE, Nuamah IK (2013). Incidence of squamous cell carcinoma of the oral cavity and oropharynx in Ghanaians: - A retrospective study of histopathological charts in a teaching hospital. *WJSM*, **4**.
- Agarwal AK, Sethi A, Sareen D, Dhingra S (2011). Treatment delay in oral and oropharyngeal cancer in our population: the role of socio-economic factors and health-seeking behaviour. *Indian J otolaryngol Head Neck Surg*, **63**, 145-50.
- Aminzadeh A, Motaghi A, Mohammadi E (2013). Epidemiologic study of oral and paraoral malignancies in one cancer referral center in Isfahan during a 5-year period. *J Isfahan Dent Sch*, **8**, 560-6.
- Andisheh-Tadmir A, Mehrabani D, Heydari ST (2008). Epidemiology of squamous cell carcinoma of the oral cavity in Iran. *J Craniofac Surg*, **19**, 1699-702.
- Ariyawardana A, Vithanaarachchi N (2005). Awareness of oral cancer and precancer among patients attending a hospital in Sri Lanka. *Asian Pac J cancer prev*, **6**, 58-61.
- Bakhtiari S, Taheri JB, Bakhshi M, et al (2012). Effect of vitamin C on salivary total antioxidant capacity in smokers. *Iranian J Pharm Res*, **11**, 1045-9.
- Chidzonga MM, Mahomva L (2006). Squamous cell carcinoma of the oral cavity, maxillary antrum and lip in a Zimbabwean population: a descriptive epidemiological study. *Oral Oncol*, **42**, 184-9.
- Cleveland JL, Junger ML, Saraiya M, et al (2011). The connection between human papillomavirus and oropharyngeal squamous cell carcinomas in the United States: implications for dentistry. *J Am Dent Assoc*, **142**, 917.
- Cortan R, Kumar V, Gillins T (1999). Robbins pathology basic of diseases. Chap 8. WB Saunders Co, pp 260-1.
- Devadiga A, Prasad KV (2010). Knowledge about oral cancer in adults attending a Dental Hospital in India. *Asian Pac J cancer prev*, **11**, 1609-13.
- Eversole LR, Wysocki GP, Sapp JP (1997). contemporary oral and maxillofacial pathology. Chap6. Mosb Co, pp 174-82.
- Franceschi S, Barbone F, Bidoli E, et al (1993). Cancer risk in farmers: Results from a multi-site case-control study in north-eastern italy. *Int J Cancer*, **53**, 740-745.
- Gervasio OL, Dutra RA, Tartaglia SM, et al (2001). Oral squamous cell carcinoma: a retrospective study of 740 cases in a Brazilian population. *Braz Dent J*, **12**, 57-61.
- Ghapanchi J, Mortazavi M, Parhiz H (2004). Analytic Evaluation of the prevalence of head and neck cancers among patients with different kinds of cancers visited in radiotherapy department of Nemazee Hospital, 2003-2004. *Shiraz Univ Dent J*, **5**, 97-105.
- Iamaroon A, Pattanaporn K, Pongsiriwet S, et al (2004). Analysis of 587 cases of oral squamous cell carcinoma in northern Thailand with a focus on young people. *Int Journal Oral Maxillofac surg*, **33**, 84-8.
- Kreimer AR, Clifford GM, Boyle P, Franceschi S (2005). Human papillomavirus types in head and neck squamous cell carcinomas worldwide: a systematic review. *Cancer epidemiol biomarkers prev*, **14**, 467-75.
- Mafi N, Kadivar M, Hosseini N, Ahmadi S, Zare Mirzaie A (2012). head and neck squamous cell carcinoma in Iranian Patients and risk factors in young adults: a fifteen-year study. *Asian Pac J cancer prev*, **13**, 3373-8.
- Mirzaei M, Hosseini SA, Ghoncheh M, et al (2016). Epidemiology and trend of head and neck cancers in Iran.

- Glob J Health Sci*, **8**, 189-193.
- Mohtasham N, Babakoochi S, Shiva A, et al (2013). Immunohistochemical study of p53, Ki-67, MMP-2 and MMP-9 expression at invasive front of squamous cell and verrucous carcinoma in oral cavity. *Pathol Research Pract*, **209**, 110-4.
- Novin K, Ameri A, Faraji S, Torbati P, Mortazavi N (2015). Head and neck squamous cell carcinoma in Iran: clinic-pathological and treatment – related factors influencing survival. *Iran J Cancer Prev*, **8**, e3842.
- Ouyang YH (2010). Skin cancer of the head and neck. *Semin Plast Surg*, **24**, 117–26.
- Pitiphat W, Diehl SR, Laskaris G (2002). Factors associated with delay in the diagnosis of oral cancer. *J Dent Res*, **81**, 192-7.
- Rawashdeh MA, Matalka I (2004). Malignant oral tumors in Jordanians, 1991-2001. A descriptive epidemiological study. *Int Journal Oral Maxillofac Surg*, **33**, 183-8.
- Sadri D (2011). Prevalence of oral squamous cell carcinoma in young and elderly groups in Iran. *Shiraz Univ Dent J*, **12**, 120-126.
- Shiva A, Mousavi SJ (2014). Evaluation of dentist's knowledge about oral cancer in Sari-Iran in 2013. *J Mazand Univ Med Sci*, **24**, 177-84.
- Shojaei S, Zargarani M, Baghaei F, et al (2015). Frequency of head and neck cancers in children and adolescents in an Iranian population from 1989 to 2009. *Avicenna J Dent Res*, **7**, e25249.
- Siriwardena BS, Tilakaratne A, Amaratunga EA, Tilakaratne WM (2006). Demographic, aetiological and survival differences of oral squamous cell carcinoma in the young and the old in Sri Lanka. *Oral oncol*, **42**, 831-6.
- Silverman SJR (2003). Atlas of Clinical Oncology Oral Cancer. Chap 1, Ontario: B.C. Decker Inc., pp 1-4.
- Razavi SM, Siadat S, Rahbar P, Hosseini SM, Shirani AM (2012). Trends in oral cancer rates in Isfahan, Iran during 1991-2010. *Dent Res J (Isfahan)*, **9**, 88-93.
- Yaghoobi R, Aliari AA, Emad Mostovfi N, Latifi SM (2004). Epidemiologic study of oral cancers in khouzestan province in a ten years period (1992-2002). *Iran J Dermatol*, **8**, 24-31.