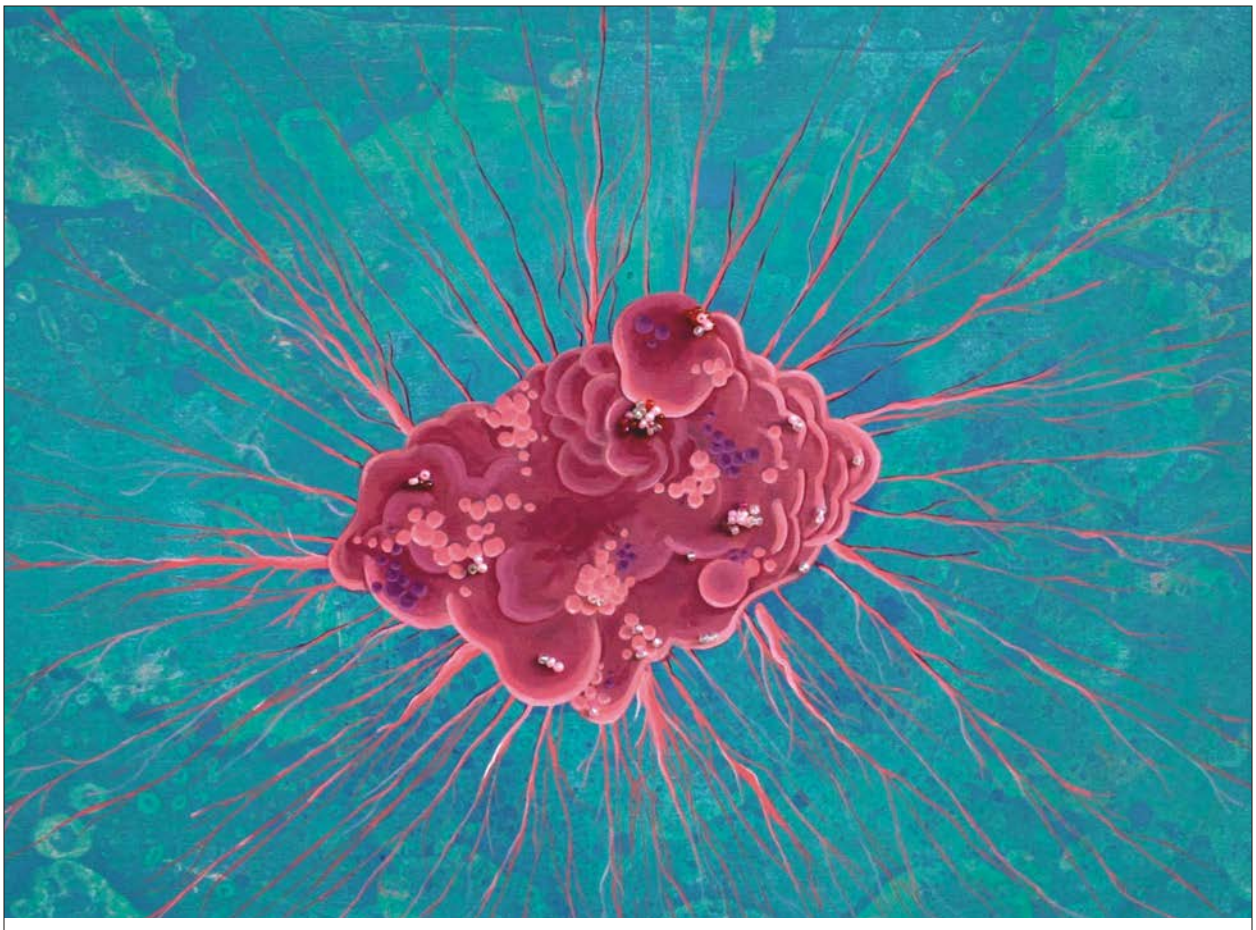

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Research Article
Prevalence of Oral and Pharyngeal Cancers in Kermanshah Province, Iran: A Ten-year Period

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Abstract

Background: Oral and pharyngeal cancer (OPC) is an entity constituted by a group of tumors that increase in several heterogeneous anatomical sites and therefore, it is difficult to establish comparisons. **Objective:** The aim of this study is to evaluate the incidence of OPCs based on ICD-10 in Kermanshah, Iran in a 10 year period. **Materials and Methods:** Of 14421 cancer patients during 2004-2013 in Kermanshah province, 327 (2.15%) cases had OPCs. Eight cases didn't have enough information and were censored from the study. Therefore, 319 patients were entered into this study. The registered cancers were coded using ICD-10. The OPCs were defined by C00 to C14. **Results:** A total of 319 patients [208 males (65.2%) and 111 females (34.8%)] with OPCs were reported during the 10 year period. The incidence for all patients was at a peak of 41 cases in 2007. In total, 75.2, 17.2 and 7.2% of sites of tumor were in the oral cavity, pharynx and salivary glands, respectively. Squamous cell carcinoma and adenoid cystic carcinoma had the most prevalence in both sexes. Lip (54.8% male and 40.5% female) and tongue (11.1% male and 13.5% female) had the most prevalence in both sexes. **Conclusion:** The prevalence of OPCs in a lot of studies was more in men and they were more in elderly patients. Based on studies, the oral cavity is the most common site of OPCs and also lip is the most common anatomical site for OPCs in more regions of the world, except for European countries.

Key words: Epidemiology, oral and pharyngeal cancer, Western Iran, SCC, oral cavity

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Cancer of the oral cavity is one of the most common cancers among head and neck cancers (HNCs)[1]. Oral cancer is 8th most common cancer in the world[2]. Oral and pharyngeal cancer (OPC) is an entity constituted by a group of tumors that increase in several heterogeneous anatomical sites and therefore, it is difficult to establish comparisons[3]. The prevalence of OPC per geographic region around the world is large and incidence rates are higher in developed countries than in developing countries[4]. The incidence rate of OPC is higher in developed countries than in developing countries[5]. In countries of southern Asia such as India, oral cancer is the most common cancer in males and 3rd in females after breast and cervix uteri tumors. Eastern, Western and Southern Europe, New Zealand, Australia and Melanesia are other geographic areas with high incidences[6]. This prevalence ranges from a low incidence of 1-2% of all malignant tumors in Japan to over 40% in Sri Lanka and approaching 50% in India[6]. While, the burden of oral cavity cancer in Iran is lower than other Asian countries[7] but incidence, mortality and survival rates and trends for OPC are dynamic and can be different over time and based on age, sex and racial group[8]. The etiology of oral cancer has several factors[9]. The most important etiological factors are tobacco and excess consumption of alcohol[10,11]. Epidemiologic aspects of OPCs in Iran have not been studied adequately[12]. Because few studies that have been reported in Iran especially, in the West of Iran in recent years[1], the aim of this study is to evaluate the incidence of OPCs based on ICD-10 in Kermanshah province, Iran in a 10 year period that can comprise the prevalence of OPCs over time and trends of those in the population compared with other areas.

MATERIALS AND METHODS

Kermanshah is the largest province in the West of Iran and is Iraq's neighbor. The estimated population of the province is around 2000000 population with the average annual growth of 0.69 and its population was extracted from the Statistical Center of Iran[13]. Kermanshah has established a pathology-based cancer registry system in 2001[14]. This study was approved by the Ethics Committee of Kermanshah University of Medical Sciences, Kermanshah, Iran. Of 14421 cancer patients from 1 Jan, 2004 to 31 Dec, 2013 in Kermanshah province, 327 cases (2.15%) had OPCs. Eight cases didn't have enough information and were censored from the study. Therefore, 319 patients were entered into this study. The registered cancers were coded using ICD-10. The OPCs were defined by C00 to C14. Every year that the data were collected in the provincial registry, the registered cases were checked with studies of pathology and for the cases that had mismatched, the new cases were replaced. Data were classified based on full name, father's name and age and all repeated cases were excluded from the study. In addition, according to the address provided in pathology studies 17 August, 2016 the referred cases from neighboring provinces were excluded. The following sub-locations of the oral cavity were checked, lip, gum, tongue, floor of the mouth, other parts of the mouth, oropharynx, hypopharynx, nasopharynx and ill-defined sites[15]. Only cases of primary OPCs were considered in this study (recurrent *in situ* or benign lesions were not included). The population was divided into 10 age groups (<10, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80-89 and ≥90 years).

RESULTS

A total of 319 patients [208 males (65.2%) and 111 females (34.8%)] with OPCs were reported during the 10 year period (Table 1). The total incidence between these years was higher in men and the male to female (M:F) ratio was 1.87:1. The incidence for male was at a peak of 28 cases in 2007 and for female was at a peak of 18 cases in 2012. Also, the incidence for all patients was at a peak of 41 cases in 2007.

The prevalence of OPCs based on the site of tumor and the histological type has been shown in Table 2. In both sexes, oral cavity, pharynx and salivary glands had the most sites of tumor, respectively. In total 75.2, 17.2 and 7.2% of sites of tumor were in the oral cavity, pharynx and salivary glands, respectively. Based on the histological type, Squamous Cell Carcinoma (SCC) and adenoid cystic carcinoma had the most prevalence in both sexes. In total, the prevalence SCC and adenoid cystic carcinoma were 79.6 and 6%, respectively.

The prevalence of OPCs based on anatomical site has been shown in Table 3. Lip (54.8% male and 40.5% female) and tongue (11.1% male and 13.5% female) had the most prevalence in both sexes. In total, the prevalence of lip and tongue was 49.8 and 11.9%, respectively. Also, the mean age of all patients was more than 50 years, except for the patients with the floor of the mouth and palate cancers. The M:F ratio was higher in men, except for hypopharynx cancer.

Table 1: Incidence of oral and pharyngeal cancers per 100000 people in Kermanshah province

Year	Population	No. of males	Incidence rate	No. of females	Incidence rate	Total	Incidence rate
2004	1854000	19	2.04	12	1.29	31	1.67
2005	1869000	27	2.80	8	0.85	35	1.87
2006	1879000	9	0.95	9	0.95	18	0.95
2007	1897000	28	2.95	13	1.36	41	2.16
2008	1920000	18	1.87	11	1.14	29	1.51
2009	1941000	22	2.26	13	1.33	35	1.80
2010	1931000	23	2.38	10	1.03	33	1.70
2011	1945000	18	1.85	4	0.41	22	1.13
2012	1954000	19	1.94	18	1.84	37	1.89
2013	1962000	25	2.54	13	1.32	38	1.93
Total	19152000	208	2.17	111	1.15	319	1.66

Table 2: Prevalence of oral and pharyngeal cancers based on site of tumor and histological type

Variables	Male (N = 208)	Female (N = 111)	Total (N = 319)
Site of tumor, n (%)			
Oral cavity	166 (79.8)	74 (66.7)	240 (75.2)
Pharynx	29 (13.9)	26 (23.4)	55 (17.2)
Salivary glands	13 (6.3)	10 (0.9)	23 (7.2)
Unknown area	0	1 (0.9)	1 (0.3)
Histological type, n (%)			
SCC	171 (82.2)	83 (74.8)	254 (79.6)
Adenoid cystic carcinoma	11 (3.3)	8 (7.2)	19 (0.6)
Hodgkin's lymphoma	6 (2.9)	3 (2.7)	9 (2.8)
Adenocarcinoma	5 (2.4)	5 (4.5)	10 (3.1)
Nasopharyngeal carcinoma	5 (2.4)	5 (4.5)	10 (3.1)
Mucoepidermoid carcinoma	4 (1.9)	3 (2.7)	7 (2.2)
Sebaceous carcinoma	2 (1)	0	2 (0.6)
NHL	0	1 (0.9)	1 (0.3)
Clear cell carcinoma	0	1 (0.9)	1 (0.3)
Small round cell carcinoma	0	1 (0.9)	1 (0.3)
Lymphoepithelial carcinoma	1 (0.5)	0	1 (0.3)
Melanoma	0	1 (0.9)	1 (0.3)
Verrucous carcinoma	2 (1)	0	2 (0.6)
Rhabdomyosarcoma	1 (0.5)	0	1 (0.3)

SCC: Squamous cell carcinoma and NHL: Non-hodgkin lymphoma

Table 3: Prevalence of oral and pharyngeal cancers based on anatomical site

Anatomical site	Male/female	Male, n (%)	Female, n (%)	Total, n (%)	Male, mean age (years)	Female, mean age (years)	Total, mean age (years)
Lip	2.53	114 (54.8)	45(40.5)	159(49.8)	65.23	64.89	65.13
Base of the tongue	-	0	0	0	-	-	-
Unspecified areas of tongue	1.53	23 (11.1)	15 (13.5)	38 (11.9)	58.96	56.93	58.16
Gum	1.43	10 (4.8)	7 (6.3)	17 (5.3)	67.7	60.57	64.76
Floor of the mouth	-	1 (0.5)	0	1 (0.3)	49	0	49
Palate	6	6 (2.9)	1 (0.9)	7 (2.1)	38.7	48	39.57
Unspecified areas of mouth	2.4	12 (5.8)	5 (4.5)	17 (5.3)	65.33	59	63.47
Parotid gland	1.6	8 (3.8)	5 (4.5)	13 (4.0)	59.63	42.2	52.92
Other glands	1	5 (2.4)	5 (4.5)	10 (3.1)	51.40	44.4	47.9
Tonsil	2.67	8 (3.8)	3 (2.7)	11 (3.4)	72.63	60	69.18
Nasopharynx	1	9 (4.3)	9 (8.1)	18 (5.6)	50.44	52.11	51.28
Hypopharynx	0.42	5 (2.4)	12 (10.8)	17 (5.3)	52.2	50.67	51.12
Unspecified areas of oral and pharynx	1.75	7 (3.4)	6 (3.6)	11 (3.4)	61.86	61.5	61.73

Figure 1 shows the prevalence of OPCs based on age group and sex. The incidence for male was at a peak of 61 cases in 80-89 years and for female was at a peak of 25 cases in 60-69 years. The incidence for all patients was at a peak of 79 cases in 80-89 years.

The prevalence of SCC in OPCs has been shown in Fig. 2. Out of 254 patients with SSC, lip, tongue, gum and hypopharynx were the most sites of tumor with 154, 36, 14 and 15 patients, respectively.

The prevalence of SCC in OPCs based on age group and sex has been reported in Fig. 3. The incidence for male was at a peak of 52 cases in 70-79 years and for female was at a peak of 20 cases in 60-69 years. The incidence for all patients was at a peak of 71 cases in 70-79 years.

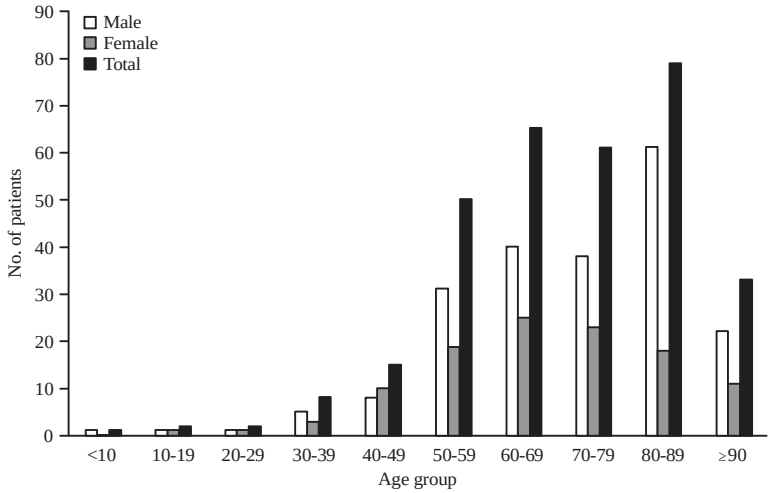

Fig. 1: Prevalence of oral and pharyngeal cancers based on age group and sex

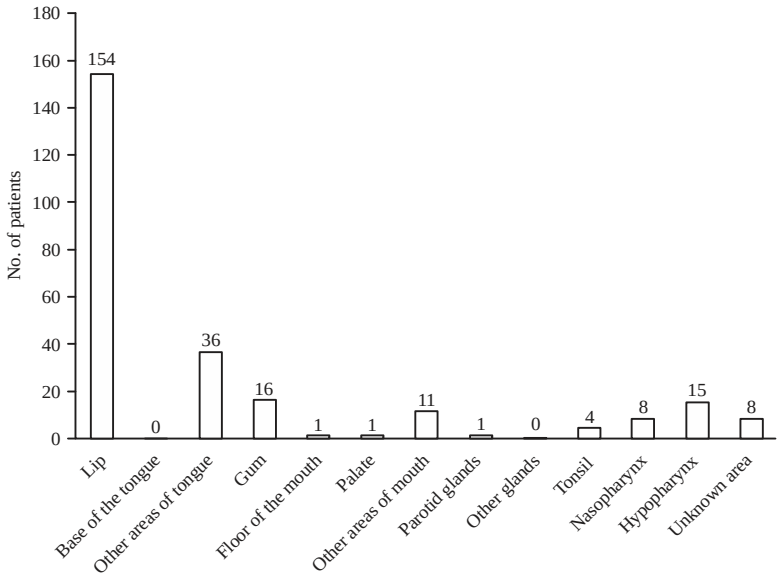

Fig. 2: Prevalence of squamous cell carcinoma in oral and pharyngeal cancers

DISCUSSION

In this study, the incidence of OPCs during a 10 year period has been shown and also the prevalence these cancers based on age and sex. In 2001, the occurrence of OPC in the USA remains constant at about 30000 new cases diagnosed per year[16]. Three studies Vargas-Ferreira *et al.*[10], Bhatia and Jha[17] and Arotiba *et al.*[18] reported that the most patients with HNC in their studies were male. The M:F ratio of OPC patients in Basque country during 1986-1994 was (7.4:1)[4], Northeast Thailand (0.6:1)[19], Northern Iran (1.76:1)[20], Argentina (7.1:1 during 1950-1970[21] and 1.24:1 during 1992-2000)[22], Southeastern Iran (2.74:1)[11], Central Iran (1.2:1 for Isfahan)[23], Western India (2.6:1)[24] and in this study (Western Iran during 2004-2013) was 1.87:1. Parkin *et al.*[25] reported that in oral cancer, worldwide estimation of M:F ratio is 2:1. Therefore, the prevalence of OPC is more in men in a lot of areas of the world that Suba[26] reported that oral cancer is a neoplasm with fairly high M:F ratio in most populations. The effect of some etiological factors on oral cancer incidence is well established in the previous study such as consumption of tobacco and alcohol[10]. The high prevalence of substance abuse (especially smoking and alcohol drinking) in males compared with women in Kermanshah province[27] can increase M:F rate for OPCs. The mean age of OPC patients in Guilan (Northern Iran during

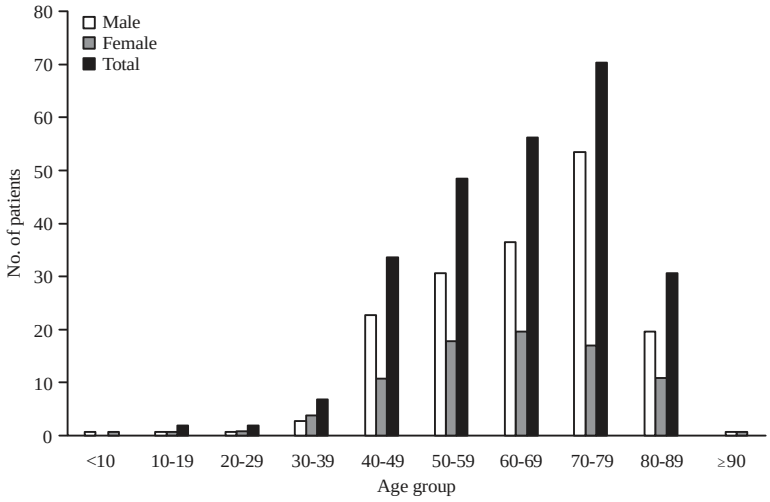

Fig. 3: Prevalence of squamous cell carcinoma in oral and pharyngeal cancers based on age group and sex

2004-2009)[20] was 58.9 years, Northeast Thailand[19] (63 years and a range of 5-98 years), Central Iran[23] (Isfahan, 52 years) and in Western Iran was upper than 50 years (most frequency between 70-79 years). Rao *et al.*[28] reported the mean age of occurrence of cancer in different parts of the oral cavity was usually between 51-55 years in most countries. Oral cancer incidence rates increased dramatically during the 20th century in the United States and Europe[29], especially among individuals under the age of 60 years.

In the Basque country, the crude incidence rate was 24.1 per 100,000 population for males and 3.1 per 100,000 for females[4], In Northern and in Western Iran, 3.69 per 1000000[20], the crude rate was 1.66 per 1000000 for both sexes (2.17 per 100,000 population for males and 1.15 per 100,000 population for females). High incidence rates were reported from developing nations like India, Pakistan, Bangladesh, Taiwan and Sri Lanka. While, an increasing trend has been observed in Pakistan, Taiwan and Thailand, a decreasing trend is seen in the Philippines and Sri Lanka[28]. An increasing trend was shown in Iran, especially in Northern Iran compared with Western Iran.

As in most, but not in all geographical areas around the world, the incidence of oral cavity cancer is more than pharyngeal cancer[30]. One study in India[24] showed that the site of occurrence of oral cancer was higher in the lower alveolus 32.14% followed by buccal mucosa 30.35%, Palate, lip 10.71%, tongue 7.14%, Gingivo-buccal sulcus 18 (16.07%) and retromolar trigone 04 (3.57%). Another study in the Basque country[4] reported that tongue (6.6%), lip (5.8%) and the oropharynx (4.9%) had the most incidence rates, respectively. In Thailand, the most common subsite in females was the lip, whereas in males it was the tongue[19]. In North of Iran, cancer of the oropharynx and lips had high incidence[20]. Two studies Torre *et al.*[6], Brandizzi *et al.*[22] reported that the tongue was the most common involved site of the oral cavity. European study of Warnakulasuriya[31] showed that among the possible oral cavity cancer sites, the tongue was the most common site that observed in European populations. Lip cancer was the 2nd most common cancer, a location that is the most commonly affected sites only in some parts of the world such as Canada and Australia. For example, more than half of oral cancers in Australians are located on the lip[32]. This study in Western Iran showed that the oral cavity was the most common sites of tumor (75.2%) and also lip (49.8%) followed by tongue (11.9%) had the most prevalence, especially in men compared with women. Involvement anatomical sites of tumor have differences between European countries compared with other countries (lip versus tongue). The high frequency of lip in the present study, especially in males can be attributed to ambient sun irradiation throughout the whole year at a generally high altitude and outdoor activities[12]. In this study, more males are farmer or construction worker, whereas the women are housewives and use anti-radiation cosmetics for their lips in outdoor. Cultural, ethnic, geographic factors and the popularity of addictive habits can effect on the prevalence of OPC in the world. In summary, the incidence of these tumors shows variability according to the geographic location in which it is diagnosed and also there is a need to spread awareness about the risk factors of OPC and immediate consultation on suspicion of cancer. Therefore, this report could show a trend of OPC in Kermanshah province and increased incidence of this cancer in the future, especially in elderly patients.

CONCLUSION

The prevalence of OPCs in a lot of studies was more in men and they were more in elderly patients. Based on studies, the oral cavity is the most common site of OPCs and also lip is the most common anatomical site for OPCs in more regions of the world, except for European countries.

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