

# Epidemiological and Etiological Factors Associated with Oropharyngeal Cancers in Tehran

ORIGINAL ARTICLE

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## ABSTRACT

**Background and Aim:** Oropharyngeal cancer is a significant cause of death and disability worldwide. In Iran it is the 13th and 17th most common cancer found in men and women, respectively. The aim of this study was to investigate etiological factors and clinical features of lesions related to oropharyngeal cancers over a 5-year period in Tehran.

**Materials and Methods:** In this retrospective cross-sectional descriptive study, 256 cases were selected from 5 clinical and educational cancer centres. Study forms were completed by collecting information from medical records; incomplete files were filled in by contacting patients by phone. The International Classification of Disease for Oncology coding system (ICD-O) was used to determine the type of malignant lesion, and SPSS software was used for data analysis.

**Results:** Squamous cell carcinoma (SCC) was the most commonly identified lesion (70.3%). The most common site of malignancy in the mouth was the tongue (25.8%). The ratio of disease incidence in men compared with women was almost 2:1. The mean age of patients was 60 years. Alcohol, drug and tobacco consumption were the most important factors in the development of oropharyngeal cancer.

**Conclusion:** The results of this study demonstrated that the most common malignancy in the mouth and pharynx was SCC. As with previous studies, we found that the ratio of disease occurrence was almost 2:1 for men compared with women. Referral of patients to specialized centres will make considerable progress towards controlling and managing these cancers.

**Keywords:** Oral and pharyngeal cancer, etiological factors, ICD-O coding system  
SCC, epidemiology.

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## Introduction

Cancer is the third leading cause of death in Iran, with more than 30 000 deaths annually.<sup>1</sup> More than 70 000 new cancer patients are diagnosed each year in Iran, and with the increasing lifespan of senior citizens it is expected that cancer incidence will increase dramatically over the next decade.<sup>1</sup> Of the numerous cancers that occur, oral cancer can be categorized as pernicious when death and disability are considered, especially in regions like South and Central Asia.<sup>2</sup> Oropharyngeal cancer has been identified as the second common cancer type in Karachi.<sup>3</sup> It has also been demonstrated that there is a relationship between oral cancer and etiological factors such as: alcohol, opium and tobacco consumption; traumatic dentures; poor oral health; inadequate nutrition; sexual activity; and genetic factors.<sup>4,5,6,7,8</sup> The most common oropharyngeal malignancy is squamous cell carcinoma (SCC).<sup>9,10,11,12</sup>

The World Health Organization (WHO) has published its aims up to year 2020, one of which is to promote the development of indices relating to oropharyngeal cancers. The goals are to reduce the incidence of oropharyngeal cancer and extend the lifespan of patients (the 5-year survival rate), increase the number of immediate referrals and thus the rate of early detection, decrease risk factors such as tobacco and alcohol consumption and inadequate nutrition, and increase the number of patients receiving particular treatments.<sup>13</sup>

The risk factors for labial malignancy differ from those for other zones of the mouth; long-term exposure to sunshine and pipe smoking were identified as probable risk factors for labial cancer in Lindqvist's study.<sup>14</sup>

Rapid consideration of doubtful lesions and etiological factors is essential for achieving an early diagnosis and cure. Clinical tumour stage, lymphatic node status and metastasis (TNM) are suitable predictors of the survival rate in cancer patients. The aim of this retrospective study was to identify the features of malignant oropharyngeal lesions and their etiologic factors identified over a 5-year period at registered clinical/educational centres in Tehran.

## Methods

This was a retrospective, cross-sectional descriptive study. Hospitals in Tehran involved in cancer registration and universities of medical science were first selected. Subsequently, the 5 educational hospitals that were the main centres for cancer treatment were chosen for further study. All archived records of oropharyngeal cancer patients held at these 5 centres were reviewed over a 5-year period between 2001 and 2006. Patient characteristics and features of oropharyngeal malignant tumours were investigated. Variables analyzed included sex, site, type of lesion and etiological factors.

From 260 reviewed records, 4 cases were eliminated because of deficient or replicated data, and so 256 were used for the final study. The prepared forms were filled out in two different ways. First, information was collected from completed medical records, and second, deficient files were completed by contacting the patients' by phone. A second purpose of contacting the patients was to determine the health status of the patients after treatment.

The forms were prepared for data collection and some parameters were converted to codes to facilitate analysis. The ICDO-coding system was used to determine the type of malignant lesion, and the TNM system was used to indicate the clinical stage in association with lymph node status.

After completing the forms, the data were analyzed using SPSS software, and a frequency table was created for each parameter. Each table shows the total frequency of a parameter as well as the specific frequency.

## Results

Of the 256 reviewed files, 159 cases were male (62.1%) and 97 female (37.9%). A total of 180 of these patients (70.3%) were affected by SCC. Of the SCC patients, 62.8% were male and 37.2% female. Among all patients, 28% had stage 1 disease, 22.6% stage 2, 15.1% stage 3 and 34.4% stage 4. The mouth and pharynx were investigated in order to determine the sites most vulnerable to lesions, and the results proved that the tongue (19.7%), buccal mucosa (18.9%) and pharynx (14%) were the most assailable regions. The most common sites of SCC were the tongue (25.8%) and throat (15.2%). For mucoepider-

moid carcinoma (MEC), the palate (42.9%) and gingiva (21.4%) were the sites most vulnerable to malignancy.

A total of 32 cases of recurrence were identified, with SCC associated with the greatest quota (25 cases). Of the SCC cases, 25% recurred, and the most common site was the tongue (9.7%). Of the 23 cases (11.3%) with reported metastasis, 14 were SCC patients (**Table 1**).

Etiological factors were also investigated. A history of malignant tumours was found in 13 cases (6.5%). One patient with SCC had a history of a benign tumour. Thirty-five patients (17.7%) had a history of tobacco consumption and 10 (5.1%) a history of drug consumption. Nine individuals (4.6%) had a radiotherapy background, and 29 patients (14.5%) had a history of denture use (**Table 2**).

## Discussion and Conclusion

In this study of data derived from 256 medical records, SCC was identified as the most common malignant oropharyngeal lesion. SCC affected 70.3% of cases (n=180). In Sargeran's study of malignant oral lesions in Tehran, the most commonly reported malignancy was also SCC

**Table 1. Metastasis frequency for each type of malignant oropharyngeal lesion.**

Lesion		Metastasis	Total
SCC	Number	14	143
	Total percent	9.8	100
BCC	Number	0	2
	Total percent	0	100
MEC	Number	1	8
	Total percent	12.5	100
Adenocarcinoma	Number	0	10
	Total percent	0	100
Lymphoma	Number	0	6
	Total percent	0	100
Other malignancy	Number	8	21
	Total percent	51.6	100
Total	Number	23	203
	Total percent	11.3	100

**Table 2. Lesion frequency according to etiological factors derived from 256 medical records held in registration centres in Tehran.**

Lesion		Etiological factor	Alcohol consumption	Tobacco consumption	Drug use	Long-term exposure to sunshine	Radiotherapy history	Denture use	Benign Tumour	Malignant tumour
SCC	Number		3	29	9	18	7	22	1	9
	Total percent		2.2	20.4	6.5	100	5	15.3	0.7	6.3
MEC	Number		0	1	0	1	0	0	0	0
	Total percent		0	12.5	0	100	0	0	0	0
Adenocarcinoma	Number		0	1	0	0	1	2	0	1
	Total percent		0	11.1	0	0	11.1	22.2	0	11.1
Lymphoma	Number		0	2	0	0	0	2	0	2
	Total percent		0	33.3	0	0	0	33.3	0	33.3
Other malignancy	Number		0	2	1	0	1	3	0	1
	Total percent		0	17.5	12.5	0	5.6	30.6	0	5.6
Total	Number		3	35	10	19	9	29	1	13
	Total percent		2.2	17.7	5.1	100	4.6	14.5	0.5	6.5

Table 3. Frequency of long-term exposure to sunshine.			
Lesion		Exposure	Total
SCC	Number	18	18
	Total percent	100	100
M.E.C	Number	1	1
	Total percent	100	100
Total	Number	19	19
	Total percent	100	100

(87%).<sup>12</sup> Another study has also previously reported that the most common oropharyngeal malignancy (about 95%) is SCC, with the tonsils being the most common site.<sup>11</sup>

The most common site of malignancy in this study was the tongue (19.7%); a total of 25.7% of these patients had SCC. In most parts of the world, the tongue is the most common site of malignant oropharyngeal lesions, especially among middle-aged individuals.<sup>15,16,17</sup>

In addition, 25 cases of SCC recurrence, 1 case of MEC and 5 cases of adenocarcinoma were identified. The most common site of SCC recurrence was the tongue, which has also been reported previously. The high recurrence of adenocarcinoma noted here supports the findings of Weing et al.<sup>18</sup>

Of the 203 cases in which tumours were detected after treatment, metastasis was distant to the primary tumour in 23 cases (11.3%). This value is greater than that reported by Kowalski et al. (3.8%).<sup>19</sup> The high rate of distant metastasis identified here may be due to the late stage of many malignant tumours reported at the time of the primary diagnosis, and longer delays in referral and treatment, which may lead to distant metastasis.

Clinical stage results were similar to those reported by Chen et al., who reported that 49% of patients were at stage 2 or higher.<sup>20</sup> SCC was also the most common malignant oropharyngeal lesion detected in the higher stages (53.3% in stages 3 and 4). TNM status is a suitable predictor of the survival rate of cancer patients.<sup>21</sup> According to Sargeran's study, approximately 59% of oral cancers are at stage III or IV at the time of diagnosis.<sup>12</sup> In the Chen et al. study performed in Taiwan, 49% of patients had stage 3 cancer at the time of diagnosis.<sup>20</sup>

Alcohol, drug and tobacco consumption were the most important factors influencing the development of oropharyngeal cancer. From 195 records with sufficient etiological information, 3 cases reported alcohol consumption. Alcohol was the second main risk factor for cancer incidence. Llewellyn et al. found in a survey of patients with oral cancer that smoking inception increased the risk of oral cancer.<sup>5</sup> In a study performed in 2003 at Kerman Medical University, the relationship between opium consumption and throat cancer was investigated, and the correlation coefficient was high.<sup>6</sup> Guneri et al. surveyed the effects of trauma and low health on oral cancer incidence in Turkey and found a positive effect.<sup>7</sup> Hashibe reported that a high rate of alcohol consumption alone was associated with increased cancer incidence.<sup>22</sup> Lindqvist found that age of inception, rate of consumption and number of years of tobacco use were effective predictors of cancer risk.<sup>14</sup> The rate of tobacco use in our study was lower than that in other studies that have reported that smoking is the most important risk factor for SCC.<sup>8,23</sup> Drug consumption was reported by 10 cases, 9 of whom were SCC patients. Alcohol and drug consumption may be not reported in Iran because their use is illegal. According to global reports of the relationship between oropharyngeal cancers and drug use, the rate of consumption must be higher in Iran.

Another risk factor is a history of a malignant tumour, which was reported by 13 cases (16.5%), 9 of whom were SCC patients. Malignancy history can be due to genetics.<sup>24,25</sup> Only one case of distant metastasis was seen in this study and it was in a SCC patient. Sometimes tumours and old cysts can be the origin of malignant tumours.<sup>14</sup>

Nine patients of 195 records were found to have a history of radiotherapy, seven of whom had SCC; one of the remaining patients had adenocarcinoma and the other lymphoma. High-energy radiation, which is used for malignant and also sometimes benign tumours, can be a potential risk factor for secondary malignancy at the radiation site (especially after the treatment of solid tumours in children).<sup>26,27</sup>

In this study, 29 patients had dentures, 22 of whom were SCC patients. In some studies, such as those by Guneri and Subapriya, denture use was associated with a high risk of cancer.<sup>14,24</sup> In a study by Tongzhong in China, only metal-based dentures were found to increase malig-

nancy risk, while polymeric dentures did not have this side effect.<sup>8</sup> However, it should be noted that the age of the patients with SCC may have been the reason for their use of dentures and thus denture use alone does not necessarily result in malignancy.

The growing acknowledgment of the importance of cancer in recent years and the increasing percentage of cancer patients has made determination of lesion characteristics and etiological factors in this population desirable. It has also led to increased consideration of the problems and barriers in health service systems that affect improvement in lifespan and quality of life. To improve cancer registration systems, the following suggestions are made: 1) More attention should be paid by clinical staff in their recording of the primary signs and risk factors of patients; 2) Training of clinical staff, especially dentists, who have the most contact with mucosal lesions is important; 3) More attention should be paid to cancer.

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