

Epidemiologic and Histopathologic Patterns of Head and Neck Cancers: A Single Institution Cohort of 1,702 Patients and a Review of the Literature

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Abstract

Original Research Article

Head and neck cancers (HNC) are the third most common cancers worldwide. They are a heterogeneous group of malignant tumors that affect various anatomical sites, including oral cavity, oropharynx, nasopharynx, hypopharynx, larynx, thyroid gland, salivary glands, nasal cavity and paranasal sinuses. In Morocco, there is a lack of epidemiological data due to the absence of a national or regional cancer registry. The present study aimed to describe the epidemiological, anatomopathological and evolutionary aspects of HNC in the southern region of Morocco. The study evaluated data from 1702 patients with HNC between 2009 and 2019. Our results showed that the main anatomical site was the nasopharynx (33.02%), and the most common histopathological type was squamous cell carcinoma (55.76%). Our study clearly showed that smoking and poor oral hygiene were the main risk factors for HNC. Thus, the present study should be considered as a first attempt to develop a national cancer registry and to shed light on the evolutionary patterns of HNC epidemiology and histopathology in Morocco.

Keywords: Head and Neck Cancer, Epidemiology, Pathology, Risk Factors.

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INTRODUCTION

Head and neck cancers (HNC) are the third most common cancer worldwide in both sexes [1]. They are a heterogeneous group of malignant tumors that affect various anatomical sites, including the oral cavity, oropharynx, nasopharynx, hypopharynx, larynx, thyroid gland, salivary glands, nasal cavity and paranasal sinuses [2]. They are most often squamous cell carcinomas [3]. The distribution of HNCs varies greatly depending on sociodemographic and lifestyle risk factors [4]. Tobacco chewing, smoking and alcohol consumption are all common risk factors for HNC [5, 6]. Chewing betel nuts is also associated with an increased risk of oral cavity cancer [7, 8]. These carcinogenic risk factors are dose-dependent [9]. Over the past 30 years, human papillomavirus (HPV) infection has been recognized as an important risk factor for the development of HNC. Oropharyngeal malignancy has shown such a strong association with HPV infection that HPV status is now considered for staging and prognosis [10-12].

The aim of this study was to examine the epidemiological and histopathological profile and trends in HNC patients at the radiation oncology department of the Mohammed VI University Hospital in Marrakech. In addition, due to the lack of a national or regional cancer registry, we aimed to provide epidemiological information to guide future research, develop health policy, help implement strategic interventions for the prevention and treatment of HNC, and create targeted awareness programs in our country.

PATIENTS AND METHODS

This study is a retrospective descriptive study gathering all cases of HNC treated between January 2009 and December 2019 at the radiation oncology department of the Mohammed VI University Hospital in Marrakech.

All patients with a histopathologic diagnosis of HNC were included in the study. We used pathology reports and consultation and hospitalization registers to identify cases and medical records to obtain information

on sex, age, risk factors, tumor extension, macroscopic appearance, and histologic type.

Data were analyzed using Statistical Package for the Social Sciences version 21. For ethical approval, the agreement to conduct the study was obtained from the competent authorities, and patient confidentiality was respected.

RESULTS

Between January 2009 and December 2019, 1702 HNC patients were managed in the radiation oncology department of the Mohammed VI University Hospital in Marrakech.

The frequency of these cancers appears to be gradually increasing during this period (Table 1, Figure 1).

Nasopharyngeal cancer was the most common site in our study (33.02%), followed by laryngeal cancer (23.56%) and oral cavity cancer (17.63%) (Table 2).

In our study, there were 1072 men (62.98%) and 630 women (37.02%), with a sex ratio of 1.7. This male predominance is valid for all sites except the

thyroid gland (Table 2, Figure 2). The mean age of the patients in our cohort was 52.61 years, with a standard deviation of 14.6 years and extreme ages of 12 and 98 years. The most affected age group was 51 to 60 years (28.17%), followed by the age group 61 to 70 years (20.91%) (Figure 3). This age distribution varied slightly according to the primary tumor (Figure 4). Histopathologically, squamous cell carcinoma was the predominant type (949 cases or 55.76%), followed by nasopharyngeal carcinoma (24.38%) and adenocarcinoma (3.64%) (Table 3).

The main risk factors found in our study were smoking in 800 patients, followed by poor oral hygiene in 328 patients, and alcohol consumption in 150 patients (Table 4).

Most of the patients were diagnosed at advanced stages. Notably, 66.51% of them were diagnosed at stage III (Table 5).

With a median follow-up of 42 months, evolution was mainly represented by remission in 60.63% of patients, 32.02% progressed or relapsed during treatment or follow-up, and 7.35% were lost to follow-up (Table 6).

Table 1: Trends in HNC frequency by year

Year	Number
2009	97
2010	107
2011	105
2012	157
2013	143
2014	148
2015	145
2016	186
2017	180
2018	214
2019	220
TOTAL	1702

Table 2: Distribution of all HNCs by site and gender

Cancer site	Number	Percentage	Gender		Sex ratio
			Male	Woman	
Nasopharynx	562	33,02 %	305	257	1.19
Larynx	401	23,56 %	345	56	6.16
Oral cavity	300	17,63%	185	115	1.61
Thyroid gland	180	10,58 %	44	136	0,32
Nose and sinus cancers	65	3,82 %	35	30	1.17
Hypopharynx	62	3,64 %	57	5	11h40
Salivary glands	60	3,53 %	41	19	2.16
Oropharynx	50	2,94 %	45	5	9.00
Primitive unknown	22	1,29 %	15	7	2.14
Total	1702	100.00%	1072	630	1,70

Table 3: Histopathological types of HNC

Histopathology	Number	Percentage
Squamous cell carcinoma	949	55,76 %
Carcinoma of the nasopharynx	415	24,38%
Adenocarcinoma	62	3,64 %
Medullary carcinoma	52	3,06 %
Papillary carcinoma	48	2,82 %
Adenoid cystic carcinoma	46	2,70 %
Anaplastic carcinoma	38	2,23%
Follicular carcinoma	30	1,76 %
Neuroendocrine carcinoma	26	1,53 %
Undifferentiated carcinoma	20	1,18 %
Mucoepidermoid carcinoma	16	0,94 %
Total	1702	100.00%

Table 4: Risk factors found in our cohort

Risk factors	Number
Smoker	800
Poor oral hygiene	328
Alcohol	150
Cannabis	88
Pre-cancerous lesions	40
HPV infection	20
Exposure to chemicals	8
Exposure to ionizing radiation	4

Table 5: Stage of disease at presentation

Stadium	Number	Percentage
III	1132	66,51 %
II	450	26,44 %
I	85	4,99 %
IV	35	2,06 %
Total	1702	100.00%

Table 6: Evolution of the patients

Evolution	Frequency	Percentage
Remission	1032	60.63%
Progression / Relapse	545	32.02%
Lost to follow up	125	7.35%
Total	1702	100.00%

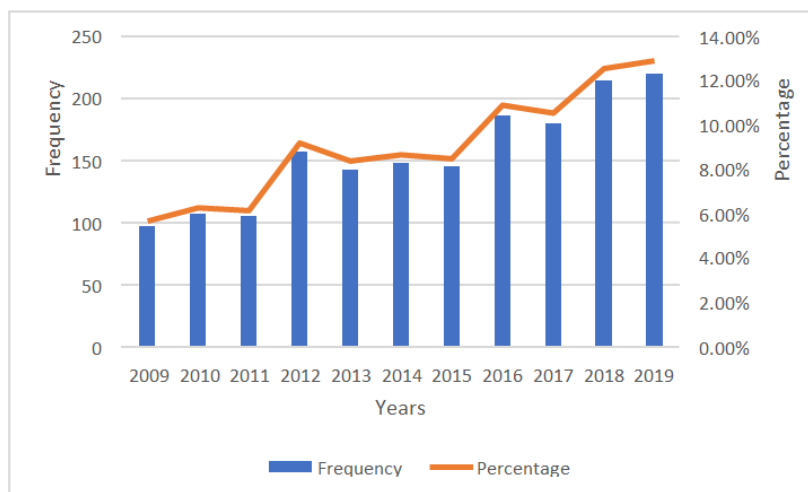


Figure 1: Trends in HNC frequency over time

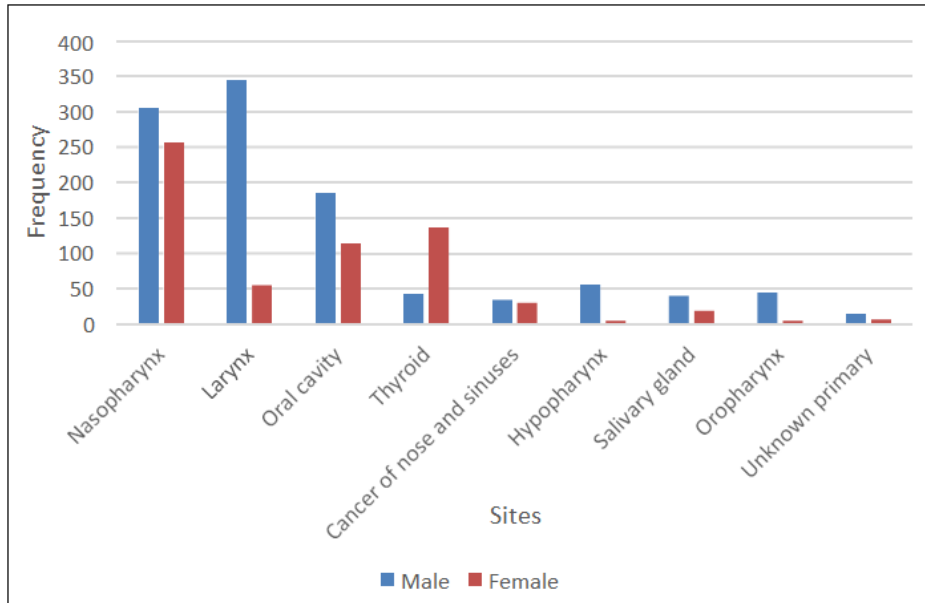


Figure 2: Distribution of all HNCs by gender

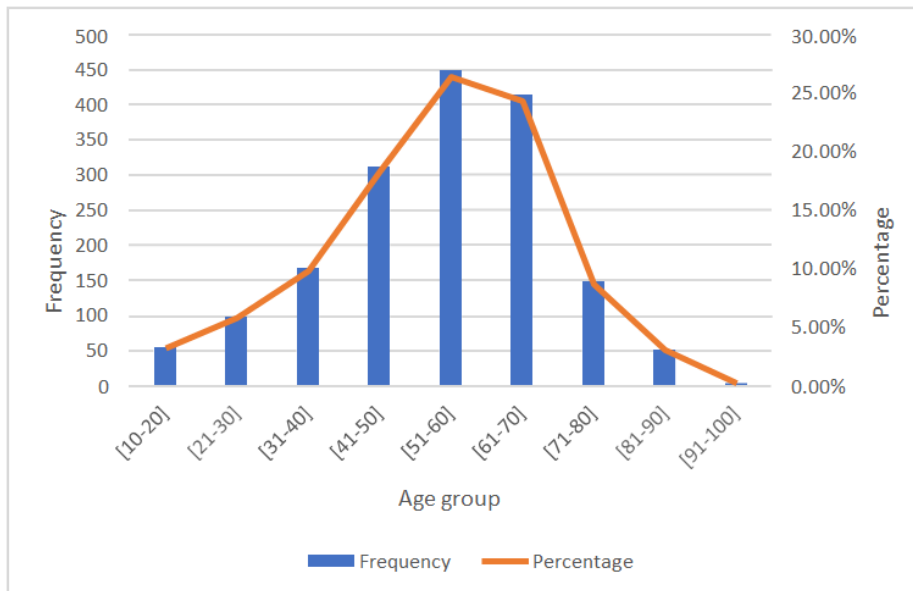


Figure 3: Distribution of all HNCs by age group

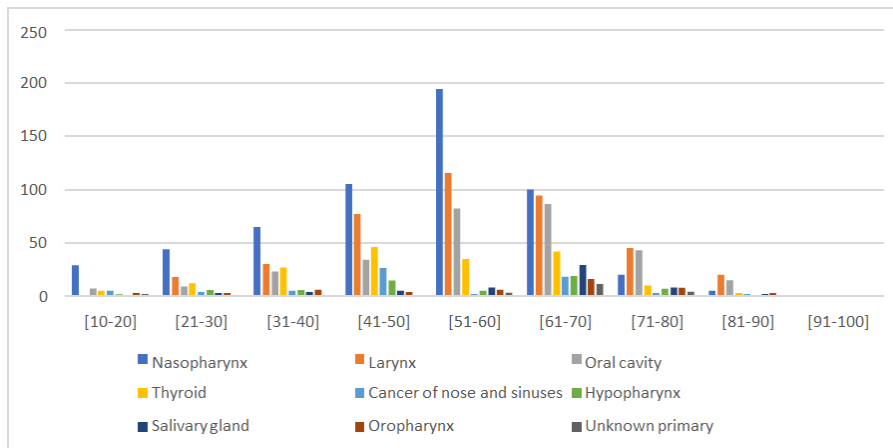


Figure 4: Distribution of all HNCs by site and age group

DISCUSSION

Every year, there are approximately 900,000 new cases of HNC with over 400,000 deaths worldwide [13]. The global incidence of HNC continues to rise, with an expected increase of 30% per year by 2030 [14, 15].

Our study aimed to describe the epidemiological, anatomopathological and evolutionary aspects of HNC at the radiation oncology department of the Mohammed VI University Hospital in Marrakech, draining a large part of the cancer patients in southern Morocco. HNC are in constant progression constituting a major public health problem in Morocco, alongside infectious, traumatic and cardiovascular diseases.

The particularly high incidence of oral cancer in Southeast Asia and Asia-Pacific regions, associated with areca nut chewing, is expected to increase with population growth [16, 17]. While the increasing incidence rates of HNC in the United States and Europe have been attributed primarily to an increase in oropharyngeal cancers, related to HPV infection [18, 19]. In our study, the most common HNC was nasopharyngeal carcinoma, which is a rare malignancy in most of the world with higher rates observed in the Cantonese population of southern China, and intermediate rates found in Southeast Asia, Middle East, and North Africa [20]; which was confirmed in our study.

Worldwide, men are significantly more affected than women, with a ratio ranging from 2:1 to 4:1 [21]; the sex ratio in our study is 1.7; this could be explained by higher alcohol and tobacco consumption among men in our country. Nevertheless, the universally recognized female predominance of thyroid cancers related to the influence of female hormones was found in our study with a sex ratio of 0.32.

Smoking, alcohol consumption, HPV and Epstein-Barr virus (EBV) infections are the most common risk factors associated with HNC [22]. In our study, smoking is the main risk factor, followed by poor oral hygiene, then alcohol because its consumption remains low in our context for socio-cultural reasons (religion). EBV and HPV infections were not documented in most of our patients, mainly because the study started in 2009 (at that time it was not a common practice in Morocco), but practices are changing in light of recent studies showing the increasing incidence of HPV-related HNC worldwide. In fact, recent data have shown a global trend of increasing incidence in HPV-related subsites, accompanied by decreasing incidence in non-HPV-related subsites in countries such as the United States, Canada, Hong Kong and South Korea [23]. Over the next 20 next years, the majority of HNCs are expected to be HPV positive, with projections that in some European countries, such as the United

Kingdom, the incidence of oropharyngeal cancer will surpass oral cavity cancer [24].

In addition, the risk of HNC increases with age in all populations, with most cases diagnosed in individuals over 50 years of age [25]. This was the case in our study, where the most affected age group was 51-60 years.

In the present study, the prevalence of HNC almost doubled in 10 years, most likely due to improved access to care in our country. However, in our setting, the diagnosis is mainly made in the advanced stages, as is the case in the Surveillance, Epidemiology, and End Results (SEER) database [26]; this may be due to increasingly sensitive imaging rather than a more pejorative clinical scenario.

Overall, the 5-year survival for HNC is 50%, with hypopharyngeal cancer having the worst prognosis [25]. A recent review of the World Health Organization death certification data revealed that there has been no change in mortality rates for men and women in recent decades [27]. Survival rates can vary widely depending on geographic location, tumor site, and, most importantly, stage at diagnosis. A large cohort study in the United States found that HPV-positive tumors had a better prognosis and a greater chance of long-term survival than non-HPV cancers, supporting trends suggested by previous research [28]. More than 60% of the patients included in our study were still in complete remission; these results are encouraging but can be improved by early diagnosis and improved hospital infrastructure to overcome the challenges raised in patient management.

CONCLUSION

Despite the limitations common to retrospective studies, our work has allowed us to contribute to a better knowledge of HNC in the southern region of Morocco. The main histological type is squamous cell carcinoma, occurring around the age of 50, much more in men than in women. The main site of HNC was the nasopharynx. We note a less clear male predominance and less impact of alcohol consumption in our cohort, most probably for socio-cultural reasons. Analysis of our results may help predict future trends and design better health care policies to improve the clinical management of HNC.

Conflicts of interest: The authors declare no conflicts of interest.

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