

# Histo-Epidemiological Profile of Head and Neck Cancers in Benin

Spero H. Raoul Hounkpatin<sup>1\*</sup>, Luc Valere C. Brun<sup>2</sup>, Marie-Claire Balle<sup>2</sup>, Fatiou Alabi Bouraima<sup>1</sup>, Tire Abdias Bossou<sup>1</sup>, Nicolas H. Amegan<sup>3</sup>, Marius Claude Flatin<sup>1</sup>, Marie-Therese Akélé-Akpo<sup>3</sup>

<sup>1</sup>Department of Surgery and Surgical Specialties, Faculty of Medicine, University of Parakou, Parakou, Benin

<sup>2</sup>Department of Basic Sciences, Faculty of Medicine, University of Parakou, Parakou, Benin

<sup>3</sup>Department of Basic Sciences, Faculty of Sciences and Health, University of Abomey-Calavi, Cotonou, Benin

Email: \*speraoul@yahoo.fr

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## Abstract

**Background:** The collection of data on cancers is essential to assess their importance in a population and plan control strategies. In Benin as in many sub-Saharan Africa countries, cancer data are often not well informed. **Purpose:** To study the epidemiological and anatomopathological profiles of head and neck cancers. **Methods:** This was a descriptive cross-sectional study of head and neck cancers in Benin from January 2009 to 31 December 2014. These tumours were collected in the registers of the 5 anatomy-pathological laboratories in Benin as well as in that of the only hospital in the country that sends its requests for histological examination abroad. **Results:** During the period, 611 cases of head and neck tumour were reported, including 298 malignant cases, or 48.8%. The average age was  $45.3 \pm 18.7$  years (extremes: 1 year and 91 years) with a maximum of cases between 50 and 60 years (19.1%). The sex ratio was 1.2. The cancers occurred mainly in the pharynx (27.9%), the oral cavity (19.8%), the nose, sinuses and jaws (18.1%), the thyroid (12.8%), the salivary glands (8.7%) and the larynx (8.4%). They were of epithelial origin in 79.5% of cases, mainly squamous cell carcinomas (50.3%) and lymphomas in 12.8% of cases. **Conclusion:** Head and neck cancer is preventable. A special place should be given to the fight against cancer in Benin. Strategies to prevent and manage these cancers cannot be put in place without accurate data collection.

## Keywords

Cancer of the Head and Neck, Squamous Cell Carcinoma of the Head and Neck, Cancer of the Mouth, Cancer of the Larynx

## 1. Introduction

Cancer, once considered a public health problem only in high-income countries, is now on the rise in developing countries and is the second leading cause of death worldwide after cardiovascular disease [1] [2] [3]. In sub-Saharan Africa as in many developing countries, cancer data are often not well informed; perhaps because cancer is perceived as a secondary health problem in the face of the importance of infectious disease [2] [4] [5] [6] [7]. However, the collection of information on cancers is essential to assess their importance in a population and plan control strategies [1] [8] [9]. In Benin, like other African countries, there is currently no truly national database for cancer data collection [2]. To get an idea of the situation in Benin regarding head and neck cancers, this study was undertaken with the objective of studying the epidemiological and pathological profiles of head and neck malignancies in Benin from 2009 to 2014.

Head and neck cancers taken as a whole are among the most frequent cancers in the world. These are the most common cancers in developing countries, particularly those in the oral cavity in South and Southeast Asian countries [10]. The incidence of head and neck cancers, underestimated in Africa but nevertheless increasing, varies from one region to another depending on lifestyle and the prevalence of risk factors [1] [11] [12]. Alcoholism and smoking are known to be the main risk factors for head and neck cancers, which explains the high male prevalence of these cancers (women making less use of them although the number of female smokers is increasing) [13] [14] [15] [16]. Nevertheless, a significant proportion of head and neck cancers in women and young people (<45 years of age) cannot be attributed to tobacco or alcohol consumption, but to other risk factors [13]. There is consistent evidence that human papillomavirus (HPV) is responsible for a high proportion of oropharyngeal cancers in non-smokers and non-drinkers [17] [18] [19] [20]. Epstein Barr virus has been recognized as an etiological agent of nasopharyngeal carcinoma [14] [21]. Other risk factors involved in the occurrence of head and neck cancers include chewing betel, arec, tobacco, especially in South and Southeast Asia, and low socio-economic living standards [22] [23] [24].

## 2. Materials and Methods

This was a descriptive cross-sectional study that examined histologically confirmed head and neck malignancies from January 1, 2009 to December 31, 2014.

These tumours were collected in the registers of the 5 public and private pathological cytology laboratories in Benin at the time of the study as well as in the register of pathological results of the only hospital in the country that sends its requests for histological examination abroad (in Italy for partnership reasons).

All reports of pathological examinations of head and neck tissue masses (ear, rhino-sinus cavities, maxilla, oral cavity, salivary glands, larynx, pharynx,

thyroid) whose histological diagnosis was a malignant tumour were used for the study. Pseudotumours (cysts, inflammatory granulomas, colloid goiter due to excess colloid substance and not to cell proliferation) and all cases whose sampling did not define the nature of the tumour were not included.

The variables studied were the age and sex of the patient, the location of the tumour and its histological type.

The data were collected from the registers and archives of the 6 institutions included in this study.

Data entry was made in EPIDATA 3.1 French version. The data analysis was carried out using the EPIINFO 3.5.1 software.

### 3. Results

#### 3.1. Frequency

During the period, 611 cases of head and neck tumours were reported, including 298 malignant tumours representing 48.8% of all histologically confirmed head and neck tumours and an annual incidence of 49.7 cases per year.

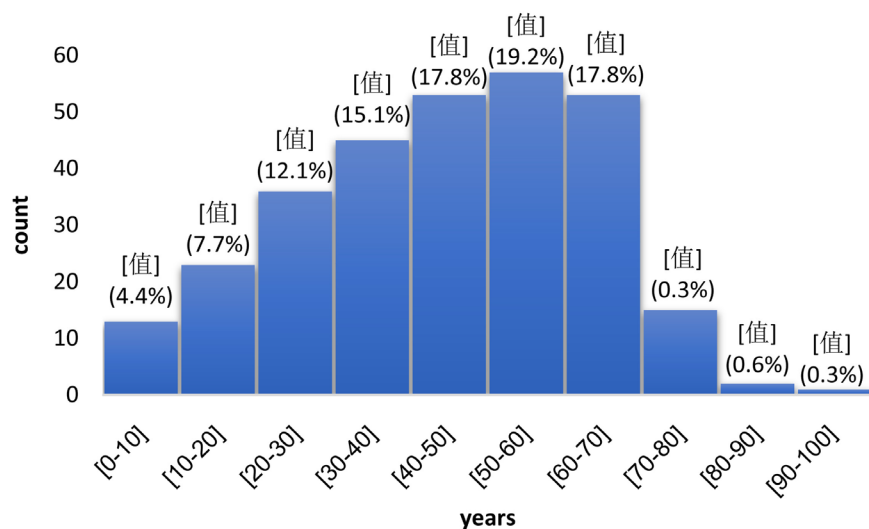
#### 3.2. Age and Sex

The average age was  $45.3 \pm 18.7$  years with extremes of 1 year and 91 years. The modal class was the age group of [50 - 60] years old with 19.1% of cases. One hundred and sixty-three patients (54.7%) were between the ages of 40 and 70. **Figure 1** shows the distribution of patients by age.

Malignant head and neck tumours concerned male subjects in 55% of cases and female subjects in 45% of cases, *i.e.* a sex ratio equal to 1.2.

#### 3.3. Headquarters

Cancers were found in the pharynx in 27.9% of cases, in the oral cavity in 19.8%



**Figure 1.** Distribution of patients by head and neck malignancies according to age of patients in Benin from 2009 to 2014.

of cases, and in the nose, sinuses and jaws in 18.1% of cases. **Table 1** shows the distribution of head and neck cancers by site.

### 3.4. Histological Types

**Table 2** shows the distribution of head and neck cancers by histological type. Head and neck cancers were of epithelial origin in 79.5% of cases and lymphomas in 12.8% of cases.

**Table 1.** Distribution of patients by head and neck malignancies according to their location in Benin from 2009 to 2014.

	Count	Percent
Pharynx	83	27.9
Oral cavity	59	19.8
Nose, sinuses and jaws	54	18.1
Thyroid	38	12.8
Salivary glands	26	8.7
Larynx	25	8.4
Malignant cervical adenopathies	10	3.3
Ears	3	1.0
<b>Total</b>	<b>298</b>	<b>100.0</b>

**Table 2.** Distribution of patients by head and neck malignancies according to their histological type in Benin from 2009 to 2014.

		Count	Percent
<b>Epithelial tumours 237 (79.5%)</b>	Squamous cell carcinoma	150	50.3
	Papillary carcinoma	26	8.7
	Adenocarcinoma	16	5.4
	Cystic adenoid carcinoma	12	4.0
	Follicular carcinoma	8	2.7
	Muco-epidermal carcinoma	4	1.3
	Undifferentiated carcinoma	2	0.7
	Other carcinomas	19	6.4
<b>Lymphoma 38 (12.8%)</b>	Non-Hodgkin's lymphoma	25	8.5
	Hodgkin's lymphoma	8	2.7
	Burkitt's Lymphoma	4	1.3
	Plasmocytoma	1	0.3
<b>Soft tissue tumours 16 (5.4%)</b>	Malignant fibrous histiocytoma	5	1.7
	Neuroblastoma	3	1.0
	Angiosarcoma	2	0.7
	Primary neuroectodermal tumor	1	0.3
	Others	5	1.7
<b>Bone and cartilage tumours</b>	Osteosarcome	3	1.0
<b>Melanocytic tumor</b>	Melanoma	4	1.3
<b>Total</b>		<b>298</b>	<b>100.00</b>

**Table 3** shows the most frequent histological type, the mean age of patients and the sex ratio by major sites of Head and neck cancers. Apart from the glands, the most frequent histological type of tumours was squamous cell carcinoma.

#### 4. Discussion

In developed countries, the incidence of head and neck cancers is very high, well documented and has justified the implementation of control strategies that yield significant results [25] [26] [27] [28]. This is far from being the case in Africa where the reported incidences are generally hospital-based due to the absence of national case registration systems; however, various studies report remarkable incidences of head and neck cancers cases. In Burkina Faso, Sérémé *et al.* reported an annual incidence of 12.8 cases [29]; in Côte d'Ivoire, Kouassi-Ndjeundo *et al.* reported a hospital incidence of 13.6 cases per year [30]. Higher annual incidences were reported in Togo (41 cases) and Nigeria (47 cases), countries bordering Benin [31] [32]. In this study, the average number of annual cases in Benin as a whole was 49.7. These different numbers are far lower than those in developed countries but should not be considered reassuring because these cases do not really reflect reality because in our context, many patients do not reach the hospital due to financial, geographical or cultural accessibility problems. In addition, even if currently two thirds of head and neck cancers occur in developed countries, by 2030, the expected incidence of head and neck cancers is expected to exceed 1 million worldwide, most of which (73%) will come from less developed countries due to population growth, lifestyle changes with inherent risk factors, improved registration systems [33] [34] [35] [36].

In Benin, the average age of patients with head and neck cancers was  $45.3 \pm 18.7$  years, however malignant tumours occurred in all age groups (1 to 91 years), and their incidence increased steadily over the years to reach a peak between 50 and 60 years. In several of the studies reported in Africa, the average age of patients was greater than 45 years with a maximum number of cases between the 6th and 7th decade [29] [30] [31] [37] [38]. A study in northwest Nigeria found a lower average age of patients (39.5 years) than that found in

**Table 3.** Most frequent histological type, mean age and sex-ratio by main Head and neck cancers sites in Benin from 2009 to 2014.

	Most frequent histological type	Mean age	Sex-ratio
Pharynx	Squamous cell carcinoma	42.1 $\pm$ 18.3	2.0
Oral cavity	Squamous cell carcinoma	53.2 $\pm$ 20.6	1.1
Nose, sinuses and jaws	Squamous cell carcinoma	40.5 $\pm$ 18.9	0.9
Thyroid	Papillary carcinoma	43.4 $\pm$ 16.9	0.3
Salivary glands	Cylindrome and adenocarcinoma	37.6 $\pm$ 16.4	0.8
Larynx	Squamous cell carcinoma	57.4 $\pm$ 12.5	4.0

general elsewhere in Africa and even in other parts of Nigeria with a sex ratio equal to 1.2 [32]. This led the authors to raise the possibility of the existence of risk factors other than tobacco and alcohol, including HPV infection. We are inclined to think the same thing in Benin in view of the great involvement of young patients on the one hand and female patients on the other. Indeed, in Benin 117 patients (39.3%) were under 40 years of age with 72 of them (24.2%) under 30 years of age and the sex ratio was 1.2. Considering other studies carried out in West Africa in neighbouring countries, except Côte d'Ivoire where the sex ratio was 4.3, the male predominance was not very high either, with a sex ratio of 1.45 in Ghana, and 1.55 in Togo and Burkina Faso [29] [30] [31] [39].

As well as the incidence, the frequency of malignancies by location varies from country to country and even from region to region within each country [26] [35] [40]. In developed countries where cancer data are well documented, an increasing trend is observed in locations where HPV infection plays a role in cancer occurrence (oral cavity, oropharynx) while in the larynx, for example, where cancer is mainly related to smoking, the trend is downward or stagnant [41] [42] [43] [44]. In West African countries neighbouring Benin, the most frequent sites for Burkina Faso were the larynx (28.12%), thyroid (18.75%), tonsil region (8.59%); for Togo the oral cavity (36.2%), the oropharynx (18.5%) and the larynx (18.1%); for Côte d'Ivoire the larynx (61.6%), the oropharynx and the hypopharynx (20.7%) and the naso-sinus cavities (7.3%) [29] [30] [31]. In Benin, head and neck cancers were mainly located in the pharynx (27.9%) and oral cavity (19.8%), which are locations for which the role of oncogenic viruses (in addition to chronic smoking) is now well known. The sex ratios observed in these locations were 2 and 1.1 respectively. These sex ratios are well below the sex ratio of 4 observed in laryngeal cancers (classically recognized as induced mainly by chronic smoking) which came sixth position (8.4%). In addition, the average age in laryngeal cancers was relatively higher compared to other main locations of head and neck cancers in Benin, suggesting risk factors other than tobacco that induce cancer, especially after prolonged use and therefore in relatively older subjects [45]. The other main locations were respectively the nose, sinus and jaw (18.1%) in third position followed by the thyroid (12.8%) and then the salivary glands (8.7%). In these locations where tobacco is not traditionally incriminated, the predominance was female with sex ratios of 0.9, 0.3 and 0.8 respectively.

Histologically, head and neck cancers in Benin were mainly epithelial tumours (79.5%), particularly squamous cell carcinoma (50.3%) located mainly in the upper aerodigestive tract (pharynx, oral cavity, nose, sine and jaw, larynx) while in the glands, it was papillary carcinoma (8.7% in the thyroid gland with a large female predominance) and cystic adenoid carcinomas (4% in the salivary glands). This predominance of squamous cell carcinoma has been widely reported in the literature [30] [32] [44] [46] [47] [48]. In second place far behind epithelial tumours came lymphomas (12.8%) and these were mainly non-Hodgkin's malignant lymphomas. The same was true in Burkina Faso [29]. Lilly-Tariah

reported in 2009 that in many centres in Nigeria the majority of head and neck cancers were of epithelial origin and mainly squamous cell carcinomas and lymphomas were the second most frequently observed cell type [49]. Sarcomas were rather rare as were other histological types of tumours, according to data in the literature [50] [51].

## 5. Conclusion

In developing countries where non-communicable diseases are on the rise, a special place should be given to the fight against cancer. The purpose of this study is to draw attention to the significant role played by head and neck malignant tumours, which are preventable cancers, in Benin and even in Africa. Strategies to prevent and manage these cancers cannot be put in place without accurate data collection, which is far from being the case at present. Close collaboration between ENT doctors, oncologists, histologists and health authorities is essential to find ways to set up truly national and accurate cancer data collection systems.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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