

RESEARCH ARTICLE

Descriptive Epidemiology of Cancers in Togo from 2009 to 2016

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Abstract

Background: Cancer is a global public health problem. According to World Report on Cancer in 2000, developing countries are becoming increasingly affected. **Methods:** This retrospective and descriptive 8-year study of all histological confirmed cancers was conducted using data from the anatomical pathology laboratory registry of Togo's only laboratory. The parameters were frequency, site and histological type as well as age and gender. **Results:** We found 1,738 cancers in patients aged from 4 months to 109 years (mean, 50.4 ± 4. The sex ratio (M/F) was 1.3. The most frequent localizations of the cancers were the prostate (10.3%) followed by the breast (9.9%), the stomach (8.4%) and the cervix (7.2%). In women, the median age was 47.4 ± 2.9 years, and the most common cancers were breast cancer (21.2%), followed by cervical cancer (16.3%). In men, the median age was 53.2 ± 7.3 years and the most frequent cancers were prostate cancer (18.5%), non-Hodgkin's lymphoma (13.2%) and stomach cancer (10.7%). In children, Burkitt's lymphoma (41.8%), retinoblastoma (11.6%) and nephroblastoma (9.6%) were the most important cancers. **Conclusion:** Cancers are frequent in Togo, those of the prostate, breast and cervix being most important with a worse prognosis. Emphasis should be placed on early detection and diagnosis.

Keywords: Cancer- epidemiology- histology- Togo

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Introduction

Cancers are a real public health problem. They affect persons of all ages, but the risk of cancer occurring and death increases strongly with age (Micheli et al., 2002). In Western countries, the large increase in the number of elderly people results in an increase in the incidence of cancers (Droz et al., 2008; Micheli et al., 2002). The most frequent cancers are lung (12.3%), breast (10.4%) and colon-rectum (9.4%) (Droz et al., 2008). The most deadly cancers in the world are lung cancers (17.8% of all cancer deaths), stomach (10.4%) and liver (8.8%), respectively (Hashim et al., 2016). Mortality remains high despite the therapeutic advances made in recent years in the developed regions (Hashim et al., 2016). In Africa, according to the WHO, cancer will be the 3rd leading cause of death in 2020 (Crocker-Buque and Pollock, 2015). In this region of the world, nearly 25% of malignant tumors are associated with infections, including hepatitis B virus (liver cancer), human papilloma virus (cervical cancer) and *Helicobacter pylori* Stomach), HIV/AIDS (associated with non-Hodgkin's malignant lymphomas, Kaposi's Sarcoma) (Gondos et al., 2009; Husain and Ramakrishnan, 2015). In Togo, little is known about epidemiological data.

A study of the relative frequency of cancers was carried out from the data of the department of Anatomy Pathology during the years 1984-2008. During this period, 5251 cases of malignant tumors were reported (Amégbor et al., 2011). It is useful to determine, eight years later, the prevalence of cancers in Togo; since no prevention policy can be put in place without epidemiological studies and statistical analyzes. Without epidemiological surveillance, it is impossible to set up a national or even regional cancer control plan adapted to our region. The aim of this work was to determine the epidemiology of cancers and the main histological types in Togo.

Materials and Methods

We carried out a retrospective and descriptive study of all cancers diagnosed between January 2009 and December 2016 (8 years) in the only Pathological Anatomy department of the Tokoin Hospital in Lomé, Togo. Togo is a small country of 56.600Km², with a population estimated at 7,200,000 inhabitants, located between Ghana in the west and Benin in the east. These cases were compiled from the data of the registry of the laboratory. These registers included the results of surgical

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specimens and biopsies examined during the study period from all health facilities in Togo. These specimens were previously fixed at 10% formalin. The various specimens had undergone the usual techniques of paraffin embedding and cutting followed by staining with hematoxylin-eosin, supplemented in some cases by special staining in foreign laboratories with immunohistochemistry. For the distribution of different anatomical sites of cancers, we used the International Classification of Diseases adopted by the WHO in 2002 (ICD-10). The variables studied were frequency, sex, age, location and histological type.

Statistical analysis

Statistical processing and analysis of data was performed using SPSS software.

Ethics approval and consent to participate

This study received approval from the Head of the laboratory department to be conducted. Since it was counting records, patient consent was not required. However during the counting and data collection patient names were not collected in order to preserve confidentiality.

Results

We collected 1738 cancers in patients aged 4 months to 109 years. The mean age of the patients was 50.4 ± 1.4 years. The annual frequency was 217.3 cases. We recorded 770 cases (44.3%) of female subjects and 968 cases (55.7%) of male subjects, a sex ratio (M/F) of 1.3. The topographic distribution showed that cancers were predominantly located in the prostate (10.3%) followed by the breast (9.9%), the stomach (8.4%) and the cervix (7.2%) (Table 1). In women, the mean age was 47.4 ± 2.9 years, and the most common cancers were breast (21.2%), followed by cervical cancer (16.3%). In men, the mean age was 53.2 ± 7.3 years and the most frequent cancers were prostate cancer (18.5%), non-Hodgkin's lymphoma (13.2%), and cancer of the stomach (10.7%). There were six histological groups: carcinomas (n=1265 cases, 72.8%), lymphomas (n=282 cases, 16.2%), sarcomas (n=109 cases, 6.3%), embryonic tumors (n=54 cases, 1.3%), melanomas (n=6cases) and other types (n=22 cases) (Table 2).

In the age group of children (0 to 14 years), cancers represented 8.4% (n=146cases) of all cancers. The annual incidence of childhood cancers was 18.3 cases. The mean age was 8.4 ± 3.5 years. We noted 82 cases of male subjects and 64 cases of female subjects. There were five histological groups: lymphomas (n=95 cases, 65.1%), embryonic cancers (n=32 cases, 21.9%), sarcomas (n=13 cases, 8.9%), carcinomas (n=4 cases, 2.7%), and leukemia's (n=2 cases, 1.4%). The most frequent histological types were Burkitt's lymphoma (n=61 cases, 41.8%) followed by retinoblastoma (n=17 cases, 11.6%) and nephroblastoma (n=14 cases, 9.6%) (Table 2).

In the age group of young adults (15 to 39 years), cancers represented 21.2% (n=369cases) of all cancers. The annual frequency was 46.1 cases. The sex ratio (M/F) was 1.1. The most frequent cancers for women are breast

cancer (n=58 cases) followed by cervical cancer (n=42 cases) and non-Hodgkin lymphoma (n=35 cases). For men, non-Hodgkin lymphoma (72 cases) and liver cancer (34 cases) and skin (30 cases) were the most frequent.

Cancers in adults over 39-year accounted for 41% (712 cases) of all cancers. The annual frequency was 89 cases. The sex ratio (M/F) was 1.3. Breast, cervical and stomach cancers are the most prevalent sites in women with 30.4%, 26.6% and 17.5%, respectively. In men, the prostate was in first place with 24.6%, followed by non-Hodgkin lymphoma (21.5%) and stomach (12.9%). In the age group of older adults (65 years and older), cancers represented 29.4% (n=511 cases) of all cancers. The annual frequency was 63.9cas. The sex ratio (M/F) was 1.3. The most common cancer sites were women (27.7%), breast (22.8%) and stomach (16.9%). In men the prostate predominates in this age group (34.6%) followed by non-Hodgkin lymphoma (19.5%) and stomach (14.1%). Breast cancers were in 92% of the classic infiltrating canal carcinomas of SBR III histo-prognostic score predominant with 54% of these cancers. Prostate cancer was found to be predominant in 97% of cases with predominant grade 7 and 8 Gleason adenocarcinomas, accounting for 33% and 39%, respectively.

Discussion

In the absence of a national cancer registry, data on cancer mortality in several developing countries, the incidence of this disease is expressed only in relative frequencies. The relative frequency represents the percentage of a specific type of cancer compared to the total number of cancer cases observed over a given period (Crocker-Buque and Pollock, 2015; Micheli et al., 2002). Our study has certain limitations in that it is a retrospective study, with some data missing. The annual frequency reported in our series (217.3 cases) is higher than that of (Amégbor et al., 2011) which was 210 cases, consistent with the increase in cancer cases in Togo. This value is comparable to that observed in most African countries, in Niger (413cases) and Ivory Coast (494cases), but clearly lower than in Western countries (Effi et al., 2013; Fitzmaurice et al., 2017; Garba et al., 2013). The significant difference between Western values and those observed in our studies is related to screening practices, particularly breast and prostate cancer, as well as the improvement of the diagnosis of an often older population. The mean age in our study, 50.4 years, is identical to that observed in the African literature (45-55 years) (Effi et al., 2013; Garba et al., 2013). Indeed, the average age of cancer patients in Africa is often around 50, whereas in developed countries it is over 60 years (Laryea et al., 2014; Stayner et al., 2017). In all African studies, the age of onset of cancer is lower in women than in men because of the many infectious and environmental factors responsible for the early development of these cancers (Amégbor et al., 2011; Laryea et al., 2014). In developed countries, older age groups constitute a large segment of the population. In the United States, cancer is a predominant disease in the elderly: 58% of all new cases of cancer and 66% of all deaths due to cancer occur in 12% of the population over

Table 1. Distribution of Cancers by Seat and Sex

CIM-10	Site	Male		Female		Both sexes	
		n1	%	n2	%	N(n1+n2)	%
C0	Lips	5	0,5	3	0,4	8	0,5
C01-C02	Tongue	10	1,0	2	0,3	12	0,7
C3 - C6	Oral cavity	6	0,6	2	0,3	8	0,5
C07-C08	Salivary gland	31	3,2	9	1,2	40	2,3
C9-C14	Pharynx	30	3,1	8	1,0	38	2,2
C15	Esophagus	52	5,4	21	2,7	73	4,2
C16	Stomach	103	10,7	44	5,7	147	8,4
C17-C18	Small intestine, Colon	6	0,6	4	0,5	10	0,6
C19-C21	Rectum, Canal anal	51	5,3	34	4,4	85	4,8
C22- C24	Liver, Biliary tract	32	3,3	13	1,7	45	2,6
C25	Pancreas	9	0,9	8	1,0	17	1,0
C30-C31	Nose, sinuses	12	1,3	2	0,3	14	0,8
C32	Larynx	37	3,8	10	1,3	47	2,7
C33-C34	Trachea, bronchus and lung	24	2,5	5	0,6	29	1,7
C38	Pleura	9	0,9	2	0,3	11	0,6
C40-C41	Bone	13	1,4	8	1,0	21	1,2
C43	Skin	52	5,3	37	4,8	89	5,1
C44	Melanoma	4	0,4	2	0,3	6	0,3
C45	Kaposi's sarcoma	42	1,1	20	2,6	62	3,6
C49	Other soft tissue	11	1,3	6	0,8	17	1
C50	Breast	9	0,9	163	21,2	172	9,9
C51	Vulva	-	-	5	0,6	5	0,3
C52	Vagina	-	-	2	0,3	2	0,1
C53	Cervix	-	-	126	16,3	126	7,2
C54	Uterus	-	-	13	1,7	13	0,7
C56	Ovary	-	-	10	1,3	10	0,6
	Penis	7	0,7			7	0,4
C61	Prostate	179	18,5	-	-	179	10,3
	Testis	3	0,3			3	0,2
C64	Kidney	12	1,3	8	1,0	20	1,2
C67	Bladder	9	0,9	11	1,4	20	1,2
C69	Eye	11	1,1	10	1,3	21	1,2
C73	Thyroid	5	0,5	16	2,1	21	1,2
C77-C80	Metastasis	31	3,2	38	5,0	69	4,0
C81	Hodgkin disease	30	3,1	37	4,8	67	3,8
C82-C85	Non-Hodgkin Lymphoma	127	13,2	88	11,4	215	12,4
C90	Myeloma	3	0,3	2	0,3	5	0,3
C91-C95	Leukaemia	3	0,3	1	0,1	4	0,2
	All Sites	968	100	770	100	1738	100

65 years of age. This confirms the relationship between age and cancer in this population (Droz et al., 2008). The main cancerous sites in women were the genitals and breasts, which accounted for 45.69%. Cervical cancer, with 33.25% of cases, is the leading cause of all cancers in women. This frequency is higher than that reported by (Effi et al., 2013) in Ivory Coast (20.6%), Garba et al., 2013) Niger (28.1%). It is comparable to that observed in Madagascar (31.5%) and South Africa (32.4%) (Parkin and Bray et al., 2009).

Childhood cancers represent, in our series, 8.4% of all cancers in Togo. This frequency is slightly higher than in a previous study (7%), Kenya (6.7%), Ivory Coast (5%) (Margaron et al., 2010; Yao et al., 2012). The average age of subjects in our series was 9.2 years; comparable to those reported by Yao in Ivory Coast (8 years), Kenya (8.5 years), but different from those observed in many European countries where the average is between 4-5 years, and would explain by the early diagnosis (Laryea et al., 2014; Margaron et al., 2010; Yao et al., 2012). The

Table 2. Repartition of Cancers According to Groups and Histological Types

Histological types and groups	Number of cases (n)	(%)
Carcinomas (n= 1265 cases)		
Adenocarcima	504	29
Squamous cell carcinoma	391	22.5
Infiltrating ductal carcinoma	172	9.9
Cystic adenoid carcinoma	40	2.3
Hepatocarcinoma	36	2.1
Mucinous carcinoma	35	2
Transitional cell carcinoma	20	1.1.
Clear cell carcinoma	15	0.9
Basal cell carcinoma	14	0.8
Other types of carcinomas	38	2.2
Lymphomas (n=282 cases)		
Non-Hodgkin Lymphoma	215	12.4
Hodgkin disease	67	3.8
Sarcomas (n= 109 cases)		
Kaposi's sarcoma	62	3.5
Dermatofibrosarcoma	17	1
Rhabdomyosarcoma	10	0.6
Fibrosarcoma	8	0.5
Leiomyosarcoma	5	0.3
Angiosarcoma	4	0.2
Osteosarcoma	3	0.2
Embryonic tumor (n= 54 cases)		
Nephroblastoma	29	1.6
Retinoblastoma	21	1.2
Neuroblastoma	4	0.3
Melanomas	6	0.3
Other types	22	1.3
Total	17,338	100

predominance of Burkitt's lymphoma reported in our series is also reported by numerous studies in Africa where Burkitt's lymphoma accounts for 20-50% of childhood cancers (Darré et al., 2014; Yao et al., 2012). The high incidence of Burkitt's lymphoma in some parts of Africa is related to malaria endemicity in these areas. Indeed, the malaria associated with the Epstein-Barr virus would favor the occurrence of Burkitt's lymphoma (Darré et al., 2016). Embryonic cancers were dominated by retinoblastoma (11.6%) followed by nephroblastoma (9.6%), in our series. Our results are comparable to those of (Yao et al., 2012). In Cote d'Ivoire who reported a predominance of retinoblastomas followed by nephroblastomas, with 14.5% and 10.2% (Hashim et al., 2016). However, in most European countries, neuroblastomas are the most frequent embryonic cancers with a frequency of 40% (Kruger et al., 2014). This underrepresentation is linked to the weakness of the neurosurgical technical platform, which means that most of these tumors are not operated and therefore do not benefit from pathological examination for histological confirmation (Darré et al., 2014; Margaron et al., 2010). The epidemiological and morphological features of

malignant soft tissue tumors in our series are those found in the literature (Kruger et al., 2014).

Cancers of the elderly in our series accounted for 29.4% of all cancers, higher than the frequency reported in Congo by (Nkoua-M'Bon et al., 2011), which was 17.4% of cases; But very low compared to rates in Europe (60%) and the United States (65%) (Hill and Doyon, 2008). In addition to Africa, the proportion of the elderly represents only 5-10% of the population, but in the Western countries the population projections for the next fifty years predict an increase in the number of cancers associated with aging (Darré et al., 2016; Hill and Doyon, 2008). Cancers of the elderly were observed in both sexes with a slight male predominance; (Nkoua-M'Bon et al., 2011) in his series had reported a female predominance (63.1%). In the United States, cancers of the elderly occurred in the proportions of 54% in men and 46% in women (Edwards et al., 2002). Indeed, in the elderly man, prostate cancer predominates, while breast and cervical cancer predominates in elderly women. The high rates of cervical cancer seen in populations of predominantly sub-Saharan African origin are probably due to multiparty and especially to the repeated infection by human papilloma virus (HPV), which plays a major role in cervical carcinogenesis (Effi et al., 2013; Garba et al., 2013). In France and the United States, the four most frequent cancers in the population aged 65 years and over are: prostate cancer in men with an average age of 69 years, cervical and breast cancer in Women at an average age of 66 years, and colorectal and bronchopulmonary cancers in both sexes (Droz et al., 2008; Micheli et al., 2002; Walter et al., 2005). Our study shows an equally high frequency of liver cancer. The factors mentioned are aflatoxin produced by the fungi of *Aspergillus flavus* contained in cereals, which are very common in Africa, and the infectious factors, especially the endemic hepatitis B virus in certain areas in Africa (Sitas et al., 2008).

Carcinomas were the most frequent histological group in our study, dominated by the adenocarcinomas of predominant prostatic and digestive sites. The predominant histological type was ductal carcinoma infiltrating the breast and squamous cell carcinoma at the cervix. Indeed, if there is evidence of reduction in mortality from breast, colorectal and cervical cancer by screening in the population aged under 65 years, few studies have included Of people aged 70 years and over (Edwards et al., 2002). The main objective of screening is the reduction of mortality by diagnosis and treatment at an early stage of the disease (Effi et al., 2013; Walter et al., 2005). Sarcomas were the second histological group of cancers of the elderly, dominated by Kaposi's sarcoma. It is endemic in Africa with frequencies varying between 4 and 38% against frequencies less than 1% in Asia and Europe (Darré et al., 2016; Stayner et al., 2017). In Black Africa, with the advent of HIV infection, the incidence of Kaposi's disease has increased in all countries (Darré et al., 2016; Garba et al., 2013). Diffuse large B-cell lymphomas were the most frequent in our study; they account for 30-40% of lymphomas in industrialized countries (Mwanda et al., 2004). The patient's age has long been recognized as an essential prognostic factor,

being among those of the international prognostic index of aggressive lymphomas most discriminating for long-term survival (41% survival at 5 years for over 60 years versus 60% for the younger ones (Bowa et al., 2009; Laryea et al., 2014).

In conclusion, we can say that cancer pathology is increasing frequency in Togo, despite the absence of a register of cancers enabling an exhaustive collection of cases on the whole territory. It predominantly affects adult male subjects. The predominant seats are breast, cervix and prostate. Pediatric forms are dominated by Burkitt's lymphoma. The improvement of the management of this pathological entity requires the creation of laboratories equipped with an immunohistochemistry unit.

A national policy for the systematic screening of precancerous lesions and the creation of cancer centers equipped with radiotherapy would be an undeniable advantage in improving the prognosis of cancers in Togo.

Conflicts of interest

The authors report no conflict of interest.

Authors Contributions

TD: is responsible for the design of the study, undertook the field study, performed data collection, analysis and interpretation, and wrote the manuscript.

TMK, AB, NM, FGP, BT, SD, SAI, AW and KA: participated in the design of the study, supervised the data collection and participated in the data analysis.

NGK is responsible for the overall scientific management of the study, the analysis and interpretation, and preparation of the final manuscript. All authors have read and approved the final manuscript to be submitted for publication.

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