



Original research

Cancer Among Adolescents and Young Adults of Togo: an Epidemiological and Clinicopathological Study

Épidémiologie et profil histopathologique des cancers des adolescents et des jeunes adultes au Togo

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ABSTRACT

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Introduction. Our study aimed to describe the epidemiology and pattern of tumors in adolescents and young adults (AYA) managed in the oncology department of the University Teaching Hospital of Lomé, Togo. **Materials and methods.** A cross sectional retrospective study was performed from March 2016 to March 2021 in the oncology department of the University Teaching Hospital of Lomé. Medical records of patients aged 15-39 years with a histologically confirmed diagnosis of cancer were retrieved for analysis. Demographic characteristics, clinical and histological data were collected. **Results.** A total of 190 adolescents and Young Adults representing 16.9% of all cancer cases were diagnosed over the study period. There were 128 females (67.4%) and 62 males (32.6%). The majority of patients were in the age group of 35-39 years (n=84; 44.2%) and less than 5% were aged 15-19 years. The largest diagnosed group of cancer was carcinoma (n = 128; 67.4%). Breast cancer (n= 55; 43%) and gonadic cancer (n= 19; 15%) were the most common cancers in AYAs women while liver cancer (n=12; 19.4%) and non- Hodgkin lymphoma (n=9; 15%) were most common in AYAs men. Soft tissue was the most common site of cancer in adolescents aged 15-19 years, whereas Non-Hodgkin Lymphomas were most common in the 20-24 age groups. Breast cancer was the most prevalent cancer in 25-29, 30-34, and 35-39 age groups. **Conclusion.** Cancer in AYA is a significant and growing health problem. Our results show that Togolese AYAs are a heterogeneous group of patients affected by a variety of cancers. This study can help us to understand their need and to establish a standard of care for cancer in this population.

RÉSUMÉ

Introduction. Le but de notre étude était de décrire le profil épidémiologique et histologique des cancers des adolescents et des jeunes adultes à Lomé. **Matériels et méthodes.** Il s'agit d'une étude transversale descriptive et rétrospective portant sur les patients âgés de 15 à 39 ans reçus dans le service d'oncologie du CHU SO de Lomé du 1^{er} mars 2016 au 1^{er} Mars 2021. Les données épidémiologiques et histopathologiques de ces patients ont été recueillies et analysées. **Résultats.** Les adolescents et les adultes jeunes ont représenté 16.9% des patients reçus pour un cancer. Il y'avait 128 femmes et 62 hommes. La majorité des patients étaient âgés de 35 à 39 ans (n=84 ; 44.2%) et moins de 5 % étaient dans la tranche d'âge des 15-19 ans. Les carcinomes étaient le type histologique le plus fréquent. Le cancer du sein et les tumeurs gonadiques étaient les cancers les plus fréquents chez les adolescentes et les jeunes femmes tandis que le cancer du foie et les lymphomes non hodgkiniens étaient plus fréquents chez les adolescents et les jeunes hommes. Les tissus mous étaient le site tumoral le plus atteint chez les adolescents et le sein était la localisation tumorale la plus fréquente dans les tranches d'âge de 25 à 39 ans. **Conclusion.** Le spectre du cancer chez les adolescents et les jeunes adultes au Togo est hétérogène et variable selon les tranches d'âge. La connaissance de la prévalence du cancer et des types histologiques de ces patients peut aider à établir des standards de soins dans ce groupe spécifique.

INTRODUCTION

Cancer is an important problem among Adolescents and Young Adults (AYAs). More than a million new diagnoses of cancer are made annually among a global population of 3 billion AYAs worldwide [1].

Studies variably define the AYAs population but since 2006, the US National Cancer Institute and the European Network for Cancer Research in Children and Adolescents (ENCCA) agree in defining Adolescents

and Young Adults as individuals aged 15 to 39 years at cancer diagnosis [2].

Cancer remains the leading cause of disease related-death among people aged 15-24 years and the second among 25-39 years old [3].

The spectrum of cancers in AYAs is distinct from that in younger and older populations [4], and AYAs differ both from older adults and children concerning medical and psychosocial aspects [5].

Specific knowledge on AYAs cancer and their distinct spectrum is limited [6]. Cancer incidence patterns of adolescents and Young adults in developed countries have been well studied but less is known in developing countries [7].

Unlike children [8,9] and the elderly population [10], there has not been any publication on the spectrum of cancer among adolescents and young adults in Togo.

Our objective was to describe the epidemiology and patterns of tumors in Adolescents and Young adults at our cancer unit and to compare this with the available data in the literature.

MATERIALS AND METHODS

This study has been performed following the Declaration of Helsinki and has been approved by the "Comité de Bioéthique pour la Recherche en Santé (CBRS)" (Bioethics Committee for Health Research) from the Togo Ministry of Health, Ref N0: 0101/2016/MS/CAB/DGS/DPLET/CBRS).

A retrospective study was performed in the department of oncology department of the University Teaching Hospital of Lomé. Medical records of all patients aged 15-39 years registered from 1st March 2016 to 1st March 2021 (5 years) were reviewed.

Demographic data and clinicopathological features of patients with a confirmed diagnosis of cancer were extracted for analysis. Cancer sites were coded by primary site and morphology using the International Classification of Diseases of childhood cancer 3rd edition [11].

Statistical analysis and data processing was performed with the software SPSS version 20.

RESULTS

Patient's characteristics

A total of 1124 cases were registered during the five years, from March 2016 to March 2021.

There were 190 Adolescents and Young Adults aged 15-39 years diagnosed with cancer in the study period. This

represents 16.9% of the total number of cancer cases diagnosed during this period.

There were 128 females (67.4%) and 62 males (32.6%) with a female to male ratio of 2.06. The feminine predominance was observed in all age groups. Table 1.

Table 1: Age and Sex distribution of the study cohort

Age range	Female	Male	Total
	Cases	Cases	Cases (%)
15-19	5	4	9 (4.7)
20-24	9	7	16 (8.4)
25-29	20	9	29 (15.3)
30-34	33	19	52 (27.4)
35-39	61	23	84 (44.2)
Total	128	62	190 (100)

The majority of patients was in the age group of 35-39 years (n= 84; 44.2%) followed by the 30-34 age group (n =52; 27.4%). Only nine patients (4.7%) were aged 15 to 19 years at diagnosis.

Distribution of cancers in AYAs

Age subgroup and cancer diagnosis

Sarcoma (n=3; 33.3%), lymphoma (n= 2; 22.2%), and skin cancers (n=2; 22.2) were most common in adolescent (15-19 years). Carcinoma was the most common type of cancer in all the others age groups with the greatest number diagnosed in the 35-39 group (n= 67; 79.8%). Lymphomas were the second common type of cancer in AYAs under 30 years (20-24, 25-29 age groups) and the third in the AYAs aged over 30 years (30-34, 35-39 age groups). Carcinoma (n= 89; 69.5%), sarcoma (n=15; 11.7%), and germ cell tumors (n=11; 8.6%), were the most common cancer in women in the AYAs group while carcinoma (n=39; 62.9%), lymphoma (n=13; 21%), and Osseous tumors (n=3; 4.8%), were the most commonly encountered cancers among AYAs men. Carcinoma was the most frequently diagnosed type of cancer in men and women (n=128; 67.4%). Table 2

Table 2: Three most common histologic type of cancer in AYAs according to age group

Overall N=190	Male N=62	Female N=128	15-19 years N=9	20-24 years N=16	25-29 years N=29	30-34 years N=52	35-39 years N=84
Carcinoma n=128(67.4)	Carcinoma n=39 (62.9)	Carcinoma n= 89 (69.5)	Sarcoma n=3 (33.3)	Carcinoma N=8 (50)	Carcinoma n=13(45)	Carcinoma n=40 (77)	Carcinoma n=67 (79.8)
Lymphoma n= 20 (10.5)	Lymphoma n=13 (21)	Sarcoma n=15 (11.7)	Lymphoma n=2 (22.2)	Lymphoma n=5 (31.3)	Lymphoma n=5 (17.3)	Germ cell tumors n=6 (11.5)	Sarcoma n=7 (8.3)
Sarcoma n= 17 (9)	Osseous tumor n=3 (4.8)	Germ cell tumor n=11 (8.6)	Skin cancers n=2 (22.2)	Germ cell tumors n=2 (12.5)	Bone tumors n=4(13.8)	Lymphoma n=3(5.8)	Lymphoma n=5 (6)

Age subgroup and cancer site

The distribution of AYAs cancer stratified by sex and age is shown in table 3.

Table 3: Distribution of cancer site in AYAs patients according to age group

Category of tumors	Age 15-19		Age 20-24		Age 25-29		Age 30-34		Age 35-39		Total All cases (%)
	M	F	M	F	M	F	M	F			
	F	F	F	F	F	F	F	F			
Lymphoma											
Non Hodgkin Lymphoma	1	2	3	2	0	1	16 (8.4)				
	0	2	1			4					

Table 3 (suite) : Distribution of cancer site in AYAs patients according to age group							
Hodgkin Lymphoma	1	1	1	1	0	0	4 (2.1)
	0	0	0			0	
Osseous and chondromatous neoplasms							
Osteosarcoma	1	-	1	-	-		4 (2.1)
	0		2				
Chondrosarcoma	-	-	1	-	-		1 (0.5)
			0				
Soft tissue sarcoma							
Fibromatous neoplasm	-	-	0	1	0	1	0 3 (1.6)
			1				
Rhabdomyosarcoma	0	0	0	0	1	-	4 (2.1)
	1	1	1				
Others soft tissue sarcoma	0	-	0	-	0		10 (5.3)
	2		2		6		
Germ cell and trophoblastic neoplasms							
Germ cell and trophoblastic neoplasms of gonads	-	0	0	2	4	1	14 (7.4)
		2	3		2		
Melanoma and skin carcinomas							
Melanoma	-	-	-	1	0	0	3 (1.6)
					2		
Skin carcinomas	1	-	-	-	-	-	2 (1)
	1						
Carcinomas							
Other carcinoma of head and neck							14 (7.4)
Nasopharyngeal carcinoma	-	1	0	-	0		3
			1		1		
other sites in lip, oral cavity and pharynx	-	-	1	0	1	2	6
			1		1		
Nasal cavity, middle ear, sinuses, larynx, other	-	0	-	1	2	0	5
		1			1		
Carcinoma of trachea, bronchus, and lung	-	-	-	1	0	2	3 (1.6)
					0		
Carcinoma of breast	-	-	0	0	0		55 (29)
			6	18	31		
Carcinoma of genitourinary tract							21 (11)
Carcinoma of kidney	-	1	0	-	0	1	3
					1	0	
Carcinoma of bladder	-	-	-	-	-	1	1
						0	
Carcinomas of gonads	-	0	1	0	0	0	8
			2		2	3	
carcinomas of cervix and uterus	-	-	-	0	0		8
				2	6		
other carcinoma of genitourinary tract	-	-	-	-	-	1	1
						0	
Carcinoma of gastrointestinal tract							33 (17.4)
carcinoma of colon and rectum	-	1	1	3	1	2	10
		1	0			1	
Carcinoma of stomach	-	0	-	1	0	1	4
		1				1	
carcinoma of liver and intrahepatic bile ducts	-	-	1	5	0	7	14
			0			1	
Carcinoma of pancreas	-	-	-	-	-	1	2
						1	
other carcinoma of gastrointestinal tract	-	1	-	1	0	1	3
		0				0	
Carcinoma of other and ill-defined sites	-	-	-	0	1		2 (1)
				1	0		
Miscellaneous specified neoplasm							
Other specified neoplasm, NOS	0	-	-	-	-	-	1 (0.5)
	1						

The five most common cancers sites in AYAs patients in this study were breast cancer (n=55; 29%), gastrointestinal cancers (n=33; 17.4%), genitourinary

tract cancer (n=21; 11%), non-Hodgkin lymphoma (n=16; 8.4%) and head and neck cancer (n=14; 7.4%).

In the age group of 15-19 years, soft tissue tumors were most frequent while non-Hodgkin lymphoma was most common in the 20-24 age group. In contrast, Breast cancer was the most prevalent cancer in the 25-29, 30-34, and 35-39 age group; and the proportion of breast cancer increased with age.

Breast cancer (n= 55; 43%), gonadic cancer (n= 19; 15%) and others soft tissue tumors (n=10; 8%) were the most common cancers in AYAs women while liver cancer (n=12; 19.4%), Non-Hodgkin lymphoma (n=9; 15%) and colorectal cancer (n=7; 11%) were the most frequent cancers in AYAs men. Most male AYAs with liver cancer were diagnosed at age 35 to 39 years (n=7; 11.3%) and 30-34 years (n=5; 8.1%) The top five of cancer type according to the sex is summarize in table 4.

Table 4: Top five of cancer site in AYAs Male and Female

	Cancer site	Cases (%)
Male N = 62	Liver carcinoma	13 (21)
	Non hodgkin Lymphoma	9 (14.5)
	Colorectal carcinoma	7 (11.3)
	Hodgkin Lymphoma	4 (6.5)
	Testicular Germ cell	3 (4.8)
	Breast carcinoma	55 (43)
Female N=128	Gonadique cancer	19 (14.8)
	Soft tissue sarcoma	10 (7.8)
	Cervix and uterus carcinoma	8 (6.3)
	Non hodgkin Lymphoma	7 (5.5)

DISCUSSION

This study presents the spectrum of cancers diagnosed in adolescents and young adults during our first five years of activities in the oncology department in Togo.

The study has been performed using the latest definition of AYAs which define them as individuals with the age range 15-39 years at cancer diagnosis. For Adolescents and young adults, a cancer diagnosis represents an extraordinary strike in a vulnerable phase of life [5]. Indeed, this diagnostic disrupts the normal trajectories of development (physical, psychological, and social) and life goals related to family and careers [7].

During the study period, 16.9% of our patients were AYAs. This frequency is similar to that reported in Jordan [12] but different from the proportion of AYAs patients observed in Massachusetts [13] Korea [14] or Japan [15].

In Europe, cancer occurring between the age of 15 and 39 years is 4 times less than cancer occurring during the first 15 years of life and consist of 2 % of all invasive cancer each year [16]. In the United States, over 70,000 adolescents and young adults between the age of 15 and 39 are diagnosed with cancer each year but cancers in this age range represent less than 5% of cancers [2, 17]. In our country, the real incidence of cancer in the AYAs population cannot be estimated because of the lack of population-based cancer registry data, but the cancer burden in this group may be significant as Togo's population is predominantly young like in most developing countries [18].

In our study, the proportion of patients diagnosed with cancer increased with age, from 4.7% in AYAs aged 15-

19 years to 44.2% at 35-39 years. The same observation has been reported in others studies [6, 17].

The majority of patients in our series were female and the female predominance was observed in all age subgroups. This feminine predominance has been reported by several authors [6, 14, 17] and can be explained by the high percentage of breast cancer and cancers of female genital organs in AYAs.

Among AYAs, the spectrum of cancers differs according to age and sex and there was a difference in the type of cancer diagnosed in the younger and the older AYAs.

As in American AYAs [17], carcinomas were the most frequently diagnosed type of cancer in our patients both in men and women. In addition, carcinomas were the most common type of cancer in all the age subgroups except in the adolescents (15-19 years) where sarcomas were most frequent. Contrary to our result, carcinoma was the most frequent cancer type in Korean adolescents [14]. Concordantly with others studies [14,17], we observed an increase in the proportion of carcinoma with the increase in age.

Leukemias were the most frequent cancer type diagnosed in adolescents in India [19] and Japan [15]; in our study, no case of leukemias has been reported because, in our practice, these patients are managed in the hematology unit.

The top five of cancers in AYAs patients in this study were breast cancer, gastrointestinal cancers, genitourinary tract cancer, non-Hodgkin lymphoma, and head and neck cancer. This distribution is different from that reported in Massachusetts [13] where the most frequent cancers among AYAs were thyroid, breast, melanoma of the skin, germ cell and trophoblastic cancer, and Hodgkin lymphoma. The distribution of cancer sites in our patients is also different from that observed in India [19] where the commonly involved site was head and neck cancer followed by the central nervous system and gastrointestinal tract cancers. This underlined the variety of cancer sites reported in AYAs patients worldwide.

In this study, 55 breast cancer cases were observed among AYAs representing 29% of all cancers in this age group. Breast cancer has been reported as the most common cancer among Togolese women in previous studies [20, 21]. Our results suggest that breast cancer tends to be diagnosed at an earlier age in our country. This observation is similar to that reported in India [7], Jordan [12] and United States [17] where breast cancer was the most frequent cancer in AYAs women. In contrast, thyroid carcinoma was the most common in Korean AYAs females [14].

In United States [17] and Jordan [12], testicular cancers were the most common in AYAs men while Lymphomas were most frequent in Indian AYAs men [7]. In our series, liver cancer was most common in AYAs men following by Non-Hodgkin Lymphoma and colorectum cancer.

AYAs patients with cancer have poorer outcomes than pediatric and older adult patients [22, 23] because many obstacles are stand in the way of better care rates and quality of life aftercare for this unique group of patients

[23, 24, 25]. Indeed, AYAs patients do not fit neatly into the pediatric nor adult world, they have special needs that the medical system has to take into consideration [25].

In our country, care for children with cancer is centralized at the pediatric oncology unit on their age 0-14 years at diagnosis while patients aged 15 years or older are being treated in any hospital without systematic reference to the oncology department. This may impact the quality-of-care need and the outcomes of AYAs patients with cancer in our setting.

The current study provides the spectrum of cancer in Togolese AYAs but the study has some limitations such as the small sample size, the retrospective data collection, and the lack of survival analysis.

CONCLUSION

Cancer in AYAs is a significant and growing health problem. Our results show that Togolese AYAs are a heterogeneous group of patients affected by a variety of cancers. Knowing the prevalence and subtypes of cancer in AYAs can help us to understand their need and to establish a standard of care for cancer in this population. More studies are needed to provide risk factors, genetic background, and statistics of AYAs cancer in our country including incidence, mortality, and survival.

Authorship Contribution

A. A conceived the study, performed the data collection, data analysis and interpretation, drafted and revised the manuscript. K.A, K.D, and T.D performed the histopathological analysis. All authors have read and approved the final manuscript.

Disclosure

The authors declare that they have no competing interests

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