



Research Article

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Urinary bladder cancer in Cameroon: histo-epidemiological aspects of 81 cases

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Abstract

Objectives: To clarify the epidemiological and histopathological aspects of urinary bladder cancer in Cameroon. **Materials and Methods:** It was a descriptive retrospective study carried out over a period of 12 years (2004-2015) on malignant tumors of the urinary bladder, conducted in the anatomical pathology laboratories in five regions (Center, Littoral, West, South-west, North-west). The variables studied were: frequency, age, sex, histological type and. **Results:** We collected 81 cases of urinary bladder cancers, which represented 6.29% of malignant urogenital tumors. The average age of patients was 52.33±12.80 years (extremes: 22 - 90 years). The majority were males 60 (74.07%), with the male to female ratio 2.9:1. Histologically, Transitional Cell Carcinoma (TCC) were the most common histological type with 81.48% (n = 450), followed by Squamous Cell Carcinoma (SCC)- 7 cases (8.64%). **Conclusion:** Urinary bladder cancer is the second urogenital cancer in Cameroon. The predominant histological type is the transitional cell carcinoma.

Keywords: Cancer, Bladder, Epidemiology, Histopathology, Cameroon.

INTRODUCTION

Urothelial bladder cancer (UBC) is the 7th most common cancer in men and the 17th most common in women in the world. UBC is a worldwide common disease with highest incidence in developed countries, however the burden is expected to increase in developing countries^[1, 2]. The majority of bladder cancer occurs in men, and there is about a 10-fold variation in incidence rates internationally. Incidence rates are higher in Europe, Northern America, Western Asia, and Northern Africa, and lower in Eastern, Middle, and Western Africa^[3]. Smoking is the most well-established risk factor for bladder cancer, is estimated to be responsible for about 31% of bladder cancer deaths among men and 14% of deaths among women in the world^[3, 4]. In the developing world, bladder cancers are particularly associated with Schistosoma hematobium, which caused about 50% of bladder cancers in some parts of Africa (Egypt -37-48%, Tanzania - 44.9%)^[5, 6]. These two important risk factors are responsible for two major histological types, transitional cell carcinoma (TCC) and squamous cell carcinoma (SCC)^[3]. Depending on stage, the treatment consists of surgery (Transurethral Resection of Bladder Tumors (TURBT), cystectomy), radiotherapy (preoperative and postoperative) and chemotherapy (neoadjuvant and adjuvant, immediate intravesical chemotherapy instillation)^[7, 8]. For invasive and non-invasive patients with bladder tumours combined the age-standardised 5-year relative survival in Europe was 68%^[9]. In Africa, that rate is less than 50% (Zimbabwe—37.2%)^[10]. In Cameroon, According to the studies data on the incidence of bladder cancer are varied. Sow et al. in 2006 in Yaoundé, found that it was 19.2% of all urogenital cancers, with squamous cell carcinoma, the most frequent was malignant tumour with 42,42%^[11]. In a multicenter study conducted in the Littoral region in 2014, it represented 16.33%, while 40.63% of malignant tumors were squamous cell carcinoma^[12]. We made this multicenter study to present the epidemiological and histopathological profile of this disease in Cameroon, because these two previous

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studies had a limited regional character.

MATERIAL AND METHODS

The study is a descriptive and retrospective hospital based type, concerning patients from urology or oncology services in different health centers in five regions of Cameroon, diagnosed of bladder tumors between January 2004 and December 2015. The study protocol was approved by Ethics Committee of all the concerned institutions. The samples examined were mainly composed of biopsies and surgical specimens fixed in 10% formalin and processed according to the usual techniques of paraffin embedding, microtome cutting and staining with hematoxylin-eosin. Only patients for whom the diagnosis was confirmed by the histology were included in the study. The parameters studied were frequency, age, sex, histological type of the tumor. Data entry was done using computer based statistical Package for Social Sciences (SPSS) version 20. The elements of descriptive statistics were used to calculate the frequencies and proportions.

RESULTS

Epidemiological Aspects

Frequency of urogenital cancers in Cameroon

From 2004 to 2015, 1286 cases of malignant urogenital tumors were observed. According to the localization of the cancer, the affected sites included the prostate (1047 cases, 81.41%), followed by the kidney (110 cases, 8, 23%) and the bladder (81 cases, 6, 29%), as shown in Figure 1 below.

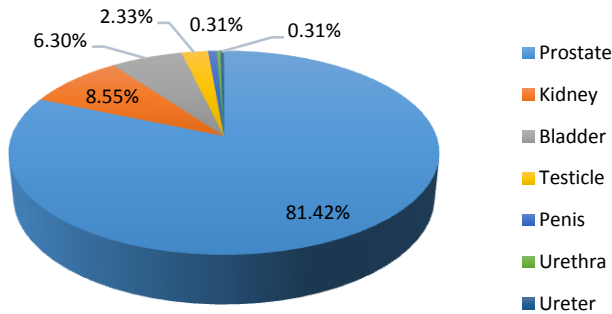


Figure 1: Distribution of urogenital cancers by seat

Sex

Of the 81 patients, the majority of patients were males 60 (74.07%); the male to female ratio was 2.9:1

Age

The average age of patients was 52.33 ± 12.80 with male to female 1.3:1, extremes ranging from 22 to 93 years old. The peak incidence was noted with patients from 60 to 69 years old with a percentage of 27.28% (24 cases) as shown in Figure 2.

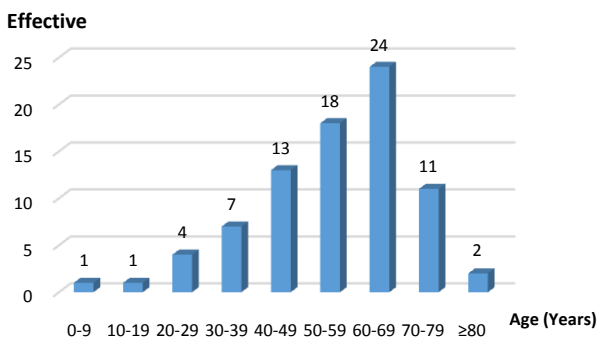


Figure 2: Distribution according to age groups

Histopathological Aspects

As shown in Table 1, a total of 66 (81.48%) cases of transitional cell carcinoma (TCC) and 7 (8.64%) cases of squamous cell carcinoma (SCC) have been identified.

Table 1: Relationship between histological types and age

Ages	Histological types of bladder cancer					Total
	TCC	SCC	ADK	Sarcoma	Lymphoma	
0-9					1	
10-19					1	1
20-29	3					4
30-39	6	1				7
40-49	12				1	13
50-59	16	1		1		18
60-69	19	2	1	2	1	25
70-79	8	3				11
≥80	2					2
Total	66 (81.48%)	7 (8.64%)	1 (1.23%)	3 (3.70%)	4 (4.94%)	81 (100.00%)

DISCUSSION

In our series, the bladder cancer in the third position among urogenital cancers after prostate and kidney (6.29%). This proportion and place are lower than that found by Sow *et al* in 2006 in Yaoundé, and Engbang *et al* in the Littoral region of Cameroon in 2014, respectively 19.2 and 16.33%. According to these authors, that cancer occupied the second place after the prostate one^[11,12]. For others authors like Darré *et al* in Togo, bladder cancer was the second 14.16%^[13]. Ouattara *et al* found higher values than previous, 28.5% of all urogenital cancers^[14]. But, our proportion is higher than the one revealed in Brazzaville by Odzebe *et al*, 4.78%^[15]. The prevalence in low-income countries is related to the existence of Schistosoma infection. Schistosomes are parasitic blood flukes, which have a mammalian host and an intermediate invertebrate host: fresh water snails^[16]. In Sub-Saharan Africa, Egypt, Sudan, and Yemen at least 41-42% of people with bladder cancer have schistosomiasis^[17]. There are four human schistosomes: *S. haematobium*, *Schistosoma Mansoni*, *Schistosoma Japonicum*, *Schistosoma Mekongi*. *S. Haematobium* (SH) is the one associated with bladder cancer. The SH, like other schistosomes is dioecious as the adult female lives in copulo in the gynecophoral canal in male; and the venules of the human urinary bladder. Eggs laid in the urinary bladder produce irritation and tissue fibrosis that may contribute to the development of human carcinogenicity^[18]. The association between Schistosoma-associated bladder cancer and SH was based on the frequent association of tumors with the presence of parasitic eggs and egg-induced granulomatous pathology involving bladder tissues. However, there is no clearly defined cellular mechanisms linking SH infestation with bladder cancer formation^[7]. Schistosoma ova deposited in the bladder provoke an intense inflammatory reaction. The chronic inflammatory reaction due to the deposition of worms and eggs in the tissue consists of macrophages and neutrophils, which produce endogenous oxygen radicals. These radicals lead to the formation of carcinogenic N-nitrosamines. Associated with the production of oxygen-derived free radicals, which may induce genetic mutations or promote the production of carcinogenic compounds, like sister chromatid exchanges, and DNA breaks. Moreover, inflammatory cells may contribute to the activation of polycyclic hydrocarbons and aromatic amines which further produce specific carcinogenic metabolites^[19].

The majority of patients were males 60 (74.07%); the male to female ratio was 2.9:1. In Ethiopia, Biluts et al found 61.9% of males and the male to female ratio-1.6:1 [20]. In Togo, males subjects were affected in 63.54%, with a sex ratio of 1.7:1 [13]. According to Ouattara, bladder cancer is a cancer that mainly reached the males with sex ratio 5:10 in Cotonou [14]. Analysis of these data has revealed, that greater exposure to risk factors like cigarette smoking may explain the male preponderance. Tobacco smoking is classified as a cause of bladder cancer. Bladder cancer risk is 3.8 times higher in current smokers compared to those who had never smoke, and his risk increases with amount and duration of smoking [21, 22]. Bladder cancer risk is 73-80% lower in ex-smokers with 25 years interval, compared with ongoing smokers; however, their risk is higher than those who have never smoked [23]. Not only active smoking but also passive smoking is related to UBC [24]. In the study about UBC among women in Tunisia, Cherif et al found that 29.6% of them had the smoking as follows: 5.77% active smoking, passive smoking 4.33% and 3.61% taking Neffa [25]. In Europe, the percentage of UBC attributable to tobacco smoking accounts for 66% of cases in males and 30% in females [26]. The causative agents are thought to be α - and β -naphthylamine, which are secreted into the urine of smokers [27].

In our study, the average age of patients was 52.33 \pm 12.80 with male to female 1.3:1, extremes ranging from 22 to 93 years old. In some countries, urinary bladder cancer is considered as a disease of young age. Biluts revealed of mean age of 49.73 \pm 1.5 (extremes: 20 to 79 years), Darré -47.4 years and Ouattara - 49.77 \pm 13.96 years [13, 14, 20]. But, other researchers found ages higher than ours; Ngowi in Tanzania - 58.45 years (extremes: 4-90 years) [27]. Compared with the general population, bladder cancer risk is 1.8 times higher in people with a first-degree relative (parent, sibling, child) with the disease; it is also higher in spouses of people with the disease, people with a family history of other smoking-related cancers [28, 29]. Also it has been proved that the second relative of individual with UBC have 2 times higher risk of developing compared to general population [24]. Authors think that inheritance of low penetrance genes (N-acetyl transferase and glutathione-S-transferase polymorphism) which makes an individual susceptible to carcinogenic exposure, is the cause of hereditary component of bladder cancer. N-acetyl transferase [24]. N-Acetyltransferase 1 (NAT1) and 2 (NAT2) are important enzymes in the biotransformation of aromatic and heterocyclic. Studies found that having a NAT2 slow acetylator genotype is a significant risk factor for bladder cancer, particularly in smokers and older individuals. Overall bladder cancer risk among NAT2 slow acetylators is about 1.3- to 1.5-times higher than in rapid acetylators; the relative risk becomes higher when data are restricted to subjects exposed to arylamines [24, 30]. Glutathione-S-Transferase M1 (GSTM1) plays an important role in the detoxification. It conjugates reactive chemicals such as arylamines and nitrosamines. Null GSTM1 is associated with increased risk of UBC [24]. Other potential risk factors for bladder cancer are other urinary tract infections and drinking tapwater with chlorination by-products or arsenic, overweight and obesity, Human papillomavirus infection, diabetes [31-37]. Exposure to certain drugs, like cyclophosphamide used in chemotherapy and heavy consumption of phenacetin-containing analgesics, has been shown to cause bladder cancer in humans. Acrolin which is a metabolite of cyclophosphamide is responsible for UBC as well as hemorrhagic cystitis. Therapeutic irradiation in the pelvic region as in the treatment of testicular cancer or cervical cancer has been implicated in UBC.

We found 66 (81.48%) cases of transitional cell carcinoma (TCC) and 7 (8.64%) cases of squamous cell carcinoma (SCC) have been identified. Some authors discovered the same predominance of the TCC. Ngowi and al in Tanzania- 75% had transitional cell carcinoma (TCC), 18% had squamous cell carcinoma (SCC) [27]; Imam et al in Egypt -71.3% of TCC, 23.4% for SCC. But our data were different with authors African researchers. In Togo, Darre discovered 37.5 % SCC, 33.33 % ADK and 26.04 % TCC [13]; for Sow, in Cameroon, SCC were the predominant

histological type with 42.42% and TCC-15.15% [11]. Prevalence of SCC is higher in Africa especially in areas endemic for schistosomiasis [27]. The most common type of bladder cancer in the United States and United Kingdom is TCC. In developed countries about 90% of bladder tumors are TCC [3, 20, 37]. Bladder cancers caused by schistosomiasis usually have a different histology (squamous cell carcinoma) compared with those associated with smoking (transitional cell carcinoma) [3]. Zheng et al in Egypt found that cigarette smoking is moderately associated with the risk of UC and is not significantly associated with risk of SCC among Egyptian men [31]. The same study provided evidence that the history of schistosomiasis is associated with the risk of UC among non-smoking Egyptian women, and confirms that this parasitic infection is a risk factor for SCC in both men and women. That means that, the eradication of schistosomiasis can contribute to the change of histological type of UBC resembling to those of western countries [27]. But, because of the urbanization, we observe increase of TCC. ADK, sarcoma and lymphoma remains rare like to other studies [11, 13, 27].

CONCLUSION

Urinary bladder cancer is the second urogenital cancer in Cameroon. The predominant histological type is the transitional cell carcinoma. The eradication of schistosomiasis, the fight against smoking and the implementation of a national screening policy can play a vital role in decreasing the prevalence of this pathology.

Conflicts of interests

No external funding or competing interests declared.

Authors' Contribution

Dr Engbang - concept, design of the study, manuscript writing. Drs Ligan, Djougmo Djimeli, Simo, Moune-data collection and compilation. Drs Sala, Fonkwa, Ephiev - compilation, literature search. Prs Fewou, Hasigov and Essame - final approval of manuscript. All authors read and approved the final manuscript.

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