Original Research Article

EPIDEMIOLOGICAL PROFILE AND HISTOPATHOLOGICAL ASPECTS OF NEPHROBLASTOMA IN CAMEROON

ABSTRACT

Objective: The main objectif was to determine the epidemiologic profile and the histologic aspects of nephroblastoma in Cameroon.

Materials And Methods: This retrospective study was conducted over a period of 6 months. It included records of patients of all ages from 5 different hospitals in Cameroon that were approved by anatomical pathology laboratory unit. For every patient, the age, gender, region of origin and histologic finding of the tumor were recorded from the laboratory registers. Data was assembled and stored using Excel 2013 software and analysed using 6.0 version of EPI info sotfware.

Results: From this study, it is noted that in Cameroon kidney cancer is the 2nd cause of urogenital cancers (with 9% of cases) after prostate cancer. Nephroblastoma was the commonest cause of kidney cancer in our country with 80 cases over a period of 14years (2004-2017). The mean pediatric age was 4,00±2,73 years while the mean adult was 30,25±19,91 years. Males were more affected with 60% predominance and most of the patients were origins from the west region of the country. The majority of tumors (53.22%) had a favourable histology.

Conclusion: In summary, nephroblastoma has a non-negligeable impact in the population of Cameroon and has diverse histopathologic aspects

KEYWORDS : kidney – nephroblastoma – Cameroon

1. INTRODUCTION

Nephroblastoma or Wilms tumor (WT) is a malignant kidney tumor developed at the expense of kidney embryonic tissue [1]. Nephroblastoma is the fourth most common malignant disease in children after leukemia, lymphoma and brain tumors [2]. It mainly affects children from 1 to 5 years old with a peak between 2 - 3 years and may be associated with several types of congenital malformations in 7 to 10% of cases [1,3]. The incidence of nephroblastomas varies among racial and ethnic groups. Blacks have a high incidence, Caucasians seem to have an intermediate incidence and Asians have a low incidence [4]. In the United States the age-standardized rate of nephroblastomas is 8.5 per million Caucasian children per year (with a slight female predominance), the figure for black American children is 10.9 [5] . In the UK, the incidence is 0.8 per 100,000 population in Poland. About 70 new cases of nephroblastoma are recorded each year with rare extra-renal localization in adults and children [6,7]. The WT has an incidence in France of 1/10000 births [8]. In 2006 according to S. O. Ekenze et al one had an

incidence between 2 and 5 years with a ratio men / women of 1.1 [9]. WT has a very favorable prognosis overall, the survival rate is 90% over 5 years. [10] clinically the main sign of call remains the appearance of an abdominal mass in 80% of cases that alert the surrounding, we also note other manifestations such as abdominal pain 37%, fever23 %, hematuria 21% and arterial hypertension [4, 11,12]. The paraclinical diagnosis is currently facilitated by the advent of ultrasound, computed tomography (CT) and MRI which allow the detection of the tumor despite the inevitable place of histology insofar as it provides the diagnosis of certainty [7]. The management of nephroblastoma is done according to the recommendations of the international society of pediatric oncologists (SIOP) which recommends preoperative chemotherapy, followed by surgical treatment and postoperative chemotherapy or according to the national study group. the Wilms tumor in North America, which recommends primary nephrectomy followed by chemotherapy, radiotherapy is reserved for patients with stage 3 disease [6]. In Cameroon, although few studies have been done on this subject, the work done by Engbang et al on urogenital cancers in the Cameroon littoral region shows a predominance of 54.84% of nephroblastoma over a period of 10 years, as long as the The study conducted by Angwafo III et al on primary renal masses in children in Yaounde shows a predominance of 72.4% over a 15-year period [13, 14]. From this analysis it appears that the studies have not been devoted specifically to nephroblastoma, hence the interest aroused by this theme towards this pathology, particularly in the control of epidemiological and histopathological aspects at the national level.

2. 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 nephroblastomas 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 and histological type of the tumor. Data entry was done using computer based statistical Package for Social Sciences (SPSS) version 20. The descriptive statistic elements were used to calculate the frequencies and proportions

3. RESULTS

3.1. Frequency of urogenital cancers in Cameroon

During our study period, 1665 urogenital cancers were recorded. Renal cancer is in the second position of urogenital tumors at 9%, after prostate cancer - 82% (fig 1)

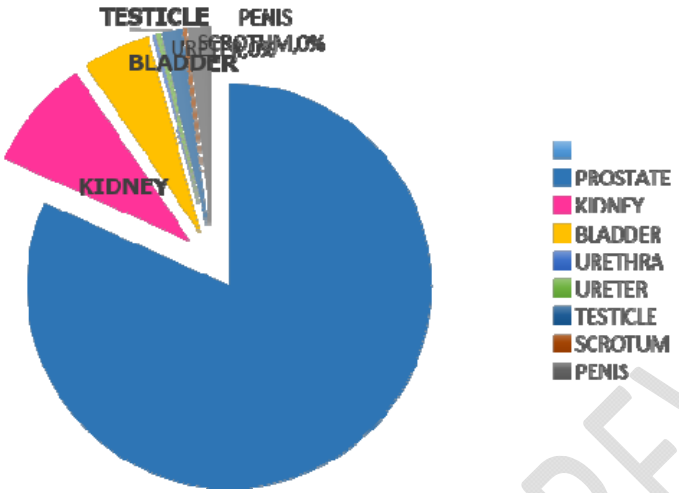

Fig 1. Distribution of patients according to the nature of the tumor

3.2. Position of nephroblastoma in the oncology of the kidney in Cameroon

A total of 146 renal cancers were identified, nephroblastoma ranked first with 80 cases (68.70%), as shown in Table I

Table 1. Position of nephroblastoma in the oncology of the kidney in Cameroon

	Male		Female		Total	
	n	%	n	%	n	%
Nephroblastoma	50	43.10	30	25.86	80	69.0
Other renal tumors	19	52.78	17	47.22	36	31.0
TOTAL	69	60	47	40	116	100

3.3. Distribution of patients by sex

In a total of 80 cases, 79 had sex defination. Out of the 79 cases, 75 were pediatric and 4 were adult. 50 cases (63%) were male and 29 cases (37%) female,with a sex ratio H / F 1.7: 1

In the pediatric proportion, out of the 75 cases, 48 were male (64%) and 27 (36%) female; with a sex ratio H / F of 1.8: 1 (fig 2)

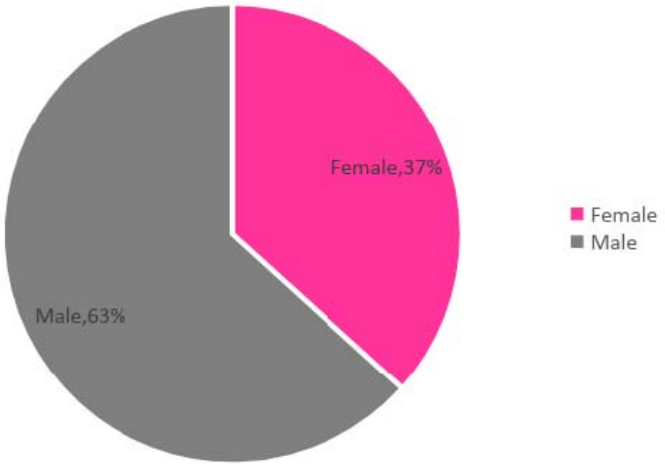

Fig 2. Distribution of patients by sex

3.4. Age distribution

Of the 80 cases identified, 79 were with age precision. Of the 79 cases, 75 were pediatric cases (0-15 years old) and 4 adult cases (16-60 years old). The age group between 0 - 5 years was the most represented with 74.68% (57 cases). Mean pediatric age was 4.00 ± 2.73 years; with extremes of 7 months and 14 years, the average adult age of 30.25 ± 19.91 years with extremes of 18 years and 60 years (fig 3)

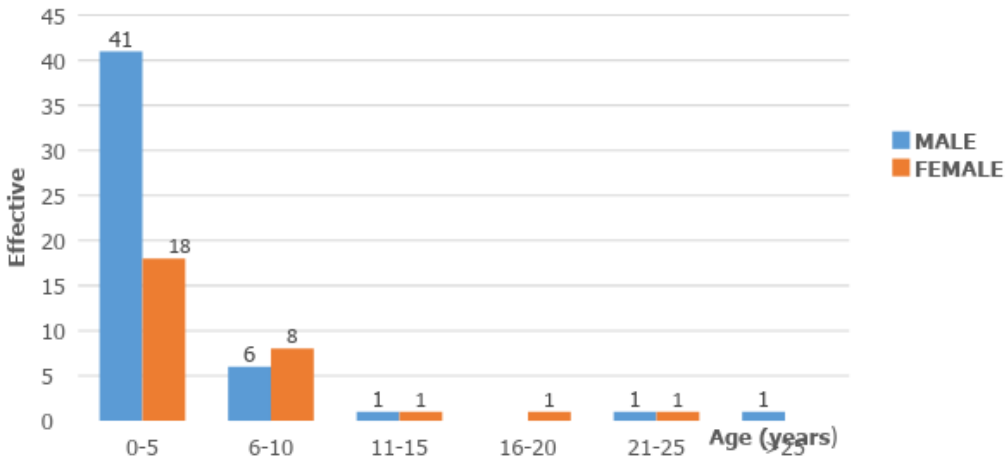

Fig 3. Distribution of patients by age

3.3. Patient distribution by tumor localization

In 51.79% of cases (29 cases) the tumor involved the right kidney and in 44.64% of cases the left kidney The bilateral form was present in 2 patients or 3.57% as shown below in Table 2. According to this table, In regards to the mono-lateral localization, the tumor sits more on the left in the male sex and on the right in female, the bilateral form is essentially feminine.

Table 2. Distribution of patients by tumor localization

	Left kidney	Right kidney	Bilateral	Total
Male	18	10	0	28
Female	7	19	2	28
Total	25 (44.64%)	29 (51.79%)	2 (3.57%)	56 100.00%)

3.4. Anatomo-Pathological Data

3.4.1. Nature of the sample

The type of sample was documented in 59 reports of the 80 collectors. The majority of the pieces were from nephrectomy in 83.05% of cases (49 cases), and biopsy in 17% of cases (10 cases).

Similarly in the pediatric population nephrectomy accounted for 78% (46 cases), 15.25% biopsy or (9 cases).

3.4.2. *Distribution of patients according to SIOP classification (International Society of Pediatric Oncology)*

In our study stage II and III were the most represented with respectively 44.78% (30 cases) and 31.58% (18 cases). Stage I had 6 cases (10.53%), Stage IV was less frequent, represented 1 case (1.75%). Stage V (bilateral) was observed in only 3.5% (2 cases) of patients (Table 3)

Table 3. Distribution of patients according to SIOP classification (International Society of Pediatric Oncology)

	STAGE I		STAGE II		STAGE III		STAGE IV		STAGE V		TOTAL	
	n	%	n	%	n	%	n	%	n	%	n	%
MALE	3	5.26	20	35.09	12	21.05	1	1.75	1	1.75	37	64.92
FEMALE	3	5.26	10	17.54	6	10.53	0	0	1		20	35.08

TOTAL	6	10.52	30	52.63	18	31.58	1 1.75	1.75 2	3.5	57	100

3.4.3. Relationship between classification and age group

The majority of patients were in stage II and the most represented age group was between 0-5 years (30cas) or 52.63%. In the adult population, there were 2 cases (3.51%) in stage III and 1 case (1.75%) in stage IV(table 4)

Table 4: Relationship between classification and age group

	0 -5		**6 -10**		**11 - 15**		**>16**		**Total**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
STAGE I	3	5.26	-		3	5.26	-		6	10.52
STAGE II	18	31.58	12	21.05	-		-		30	52.63
STAGE III	11	19.30	5	8.77	-		2	3.51	18	31.58
STAGE IV	-		-		-		1	1.75	1	1.75
STAGE V	2	3.51	-		-		-		2	3.51
TOTAL	34	59.65	17	29.82	3	5.26	3	5.26	57	100

3.4.4. Distribution of patients by seat of histological type

In our study 71.25% of patients benefited from histology. The histology was unfavorable in the majority of the cases either 33 cases (53,22%) the blastematous nephroblastoma predominated-32 cases (51,61%) then comes the standard histology or the mixed-type nephroblastoma predominates with 14 cases that is 22.58%; finally, the favorable histology with 6 cases (9.68%) (Table 5)

Table 5: Distribution of patients by histological type.

Risk level	**Histological types**	**Effective**	**Percentage**
Low risk (favorable Histology)	Mesoblastic nephromy	1	1.61
	Cystic nephroblastoma partially differentiated	3	4.84
	Completely necrotic nephroblastoma	2	3.23
Intermediate risk (standard Histology)	Epithelial Nephroblastoma	3	4.84
	Stromal nephroblastoma	6	9.68
	Mixed-type nephroblastoma	14	22.58
	Regressive nephroblastoma	0	0
	Nephroblastoma with focal anaplasia	0	0
High risk (Adverse Histology)	Predominant blastematous nephroblastoma	32	51.61
	Nephroblastoma with diffuse anaplasia	0	0
	Renal sarcoma with clear cells	1	1.61

3.2 Relationship between the histological type and the age group

As schown in table 6, the majority of patients with adverse histology were male (17 cases)

Table 6: Relationship Between Histological Type and Age Group

	0-5				6-10				11-15				≥16				TOTAL
	M	F	T	%	M	F	T	%	M	F	T	%	M	F	T	%	
Favorable	4	1	5	8.0	1	0	1	1.6	-	-	-		-	-	-		9.67
Standard	11	5	16	25.8	3	4	7	11.3	-	-	-		-	-	-		37.11
Unfavorable	17	12	29	47.8	0	0	0	0	1	1	2	3.2	1	1	2	3.2	54.23

4. DISCUSSION

In our study, kidney cancer was the second most common urogenital cancer with a prevalence of 9% (80 cases). Our result is quite different from that of Sow et al of Cameroon in 1994 from his findings urogenital cancers was in the third position after prostate and bladder with a prevalence of 1.74% (75 cases) over 13 years, while Engbang et al in the same country in 2016 found a prevalence of 8.55% (110 cases) over a 12-year period [14,15]. This shows that the number of cases of nephroblastoma in the country is increasing year by year; which at first sight could be explained by the evolution of diagnostic conditions in infrastructure, equipment and personnel to reach a larger layer of the population.

From the national point of view, we find that nephroblastoma is the first kidney cancer in Cameroon with 68.70% with 80 cases of nephroblastoma over a period of 14 years this result is similar to that found by Sow et al that nephroblastoma was in first place in kidney cancer with 75 cases in 13 years [14]. These data are similar to those of Yao Atteby et al in Côte d'Ivoire, 56 cases over 10 years and S. O Ekenze et al in Nigeria, 35 cases over 10 years [16, 17]. This difference in size could be explained on the one hand by the fact that our study is multicentric and on the other hand our duration of study which was relatively long.

Our sample consisted of 80 cases of nephroblastoma with 29 cases (37%) for the female population and a male predominance with 50 cases (63%) that is a sex-ratio H / F of 1.17: 1.These data is closer to that of Stefan et al in South Africa who found a male predominance with 75 men and 71 women with a sex ratio of 1.06: 1 and those of Ekenze et al with 22 boys and 20 girls with a male ratio to women of 1,1: 1 [18, 19].

The average pediatric age found in our study was 4 ± 2.73 years; with the extremes of 7 months and 14 years. These results are similar to those of Dafalla O. Abuidris et al in Sudan who found a mean age of 4.1 with extreme 2 months and 13 years [20]. D C Stefan et al observed an average age of 39 (range 3 to 167) months [18]. The young age of patients has been found by many authors around the world and ranged from 2.8 to 5.1 years [16, 18, 19, 21, 22]. These results show that nephroblastoma is a tumor of infancy.

The age group between 0 - 5 years was the most represented with 74.68% (57 cases). Shehu et al in Nigeria also found the same age group as the most affected [23]. Farzana Memon et al in Pakistan and CK Li et al in China found that the 0-4 age group was the most represented [21, 24].

The right kidney was the most affected with 51.79% (29 cases) followed by the left kidney with 44.64% (25 cases). These results are similar to those of Sow et al who found that the right kidney with 39 cases against 36 cases for the left kidney which was the most affected by SO Ekenze et al [14, 17] in Nigeria, with 21 cases against 14 cases for the right kidney. There are differences

from one series to the next with respect to the side most often attained. The right kidney is as frequently affected as the left kidney [10].

In our study, stages II and III were the most represented with respectively 44.78% (30 cases) and 31.58% (18 cases), stage I had 6 cases or 10.53%, stage IV was very less represented with 1 case (1.75%); stage V (bilateral) was observed in only 3.5% (2 cases) of patients. A study conducted by Y. Ladjadj et al in Algeria showed that Stage II (39%) was predominant [25]. DC Stefan et al in South Africa found that the most common stages were stage I (50%) and stage IV (23%), while stages II and III had a similar incidence of around 10% and stage V (bilateral) was observed in only 4% of patients [17]. A study conducted by A Kanyamuhunga et al in Rwanda showed nearly half of the 14/25 patients (56%) were in advanced stages, 7 children (28%) had stage IV, 7 stage III children, 6 patients (24%) with stage II, while the other five (20%) had stage I with a high-risk tumor [26]. In our study 71.25% of patients had histology. Of the 57 cases that received histology 33 cases or 53.22% are of high risk group, 14 cases or 22.58% are of intermediate risk group and 6 cases or 9.68% are low risk.

5. CONCLUSION

At the end of this study, it appears that renal cancer is the second most common urogenital cancer with 9%, nephroblastoma is the first kidney cancer in our country with 80 cases observed over 14 years. Mean pediatric age was 4.00 ± 2.73 years; while the average adult age of 30.25 ± 19.91 years. There is a predominance of maculine at 64%. Histology was unfavorable in most of our sample (53.22%).

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

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