

Original Research Article

Route of Children with Cancer to the Hematology-Oncology Unit of the Mother and Child Center of the Chantal Biya Foundation

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Abstract: Purpose: Children with cancer arrive at treatment centers at advanced stages of the disease, with a survival rate of less than 30%. This study analyzes the path of children with cancer to the Hematology-Oncology Department of the Mother and Child Center of the Chantal Biya Foundation in Yaounde. Materials and methods: We conducted a descriptive cross-sectional study from November 2015 to July 2016 including all children aged 0 to 18 years with a confirmed diagnosis of cancer. Data was collected using a questionnaire. Results: We had 155 patients, with a sex ratio of 1.38. The median age was 6 years, with peaks of 2 months and 18 years. The most represented symptoms was fever (29.2%), followed by abdominal swelling (19.4%). The median number of resorts before the CME was 3 (2-4) with a minimum of 1 and a maximum of 15. 64.5% of children were brought to consultation in primary care to a general practitioner. 91 patients had at least three remedies: doctors (69.5%), healers and others (21.8%). The referral of children was mainly made by a pediatrician (29.5%). The average time between the onset of symptoms and consultation was 8 months. Patients came mostly at stages 3 and 4 at 51% and 39.4%, respectively. Conclusion: The majority of patients go to modern medicine. The time of arrival at the Service is long, the stages to the diagnosis very advanced.

Keywords: Course - Children - Cancer- Delay- Mother and Child Centre of the Chantal Biya Foundation (MCC-CBF).

INTRODUCTION

The five-year survival rate for children with cancer has gradually improved in developed countries from 56% in 1974 to more than 81% in 2000 in the United States [1, 2]. The considerable improvement in this survival rate can be explained by the early diagnosis and advances in treatment because the prognosis is directly linked to early diagnosis [3, 4].

In sub-Saharan Africa, according to the World Health Organization (WHO), more than 160,000 children are faced with cancer every year, and about 90,000 of them die due to the disease, this prevalence remains underestimated because very few cancers of the children are diagnosed and even followed up in specialized centers [5]. The 5-year survival rate is very low at 20 or even 10% and the mortality rate is very high at 37.3% [6]. This death rate is exacerbated by late diagnosis amplified by misdiagnoses [5, 7]. In Cameroon, the overall finding is the late arrival of patients in the care center. Based on this observation, we therefore proposed to carry out a study on the course taken by children with cancer of the Hematology-oncology Department of the Mother and Child Center of the Chantal Biya Foundation (MCC / CBF).

MATERIALS AND METHODS

The MCC / CBF hosts on average 130 new cancer cases per year and remains the reference center for the management of childhood cancer in Cameroon. All biological assessments and some routine radiological examinations are free for all hospitalized

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children. The biological examinations are carried out by the Centre Pasteur of Cameroon, standard X-ray, ultrasound and CT are performed in the Radiology Department of the Central Hospital of Yaoundé. Medical treatment of Burkitt lymphoma, Hodgkin's disease, nephroblastoma and standard risk acute leukemia is free.

We carried out a descriptive cross-sectional study from November 2015 to July 2016 in the MCC/FCB Hematology-Oncology department. Included in the study was every child with a confirmed diagnosis of cancer and whose parents had given informed consent to participation. Children hospitalized for cancer relapse were excluded, as were those for whom the diagnosis of cancer had not been confirmed. A questionnaire designed by a WHO expert was filled by the parents, assisted by two student investigators in Psychology. This questionnaire was filled during the first week of hospitalization, even before the diagnosis was made, on suspicion of cancer. The hospital books of each child as well as the medical records of the patients were used to check and complete the information, including clinical and diagnostic.

Our data was recorded using CSPro software version 6.0 and analyzed using IBM SPSS software version 20.0. The qualitative variables were presented with numbers and percentages. Quantitative variables were presented with mean and standard deviation when following the normal distribution or with the median and interquartile range when this was not the case. The data collected in this way has been treated with the utmost confidentiality, in the respect of ethics and professional standards.

RESULTS

Sociodemographic characteristics

We included a total of 155 patients, 58% boys and 42% girls. The median age was 6 years with the extremes of 2 months and 18 years. Patients from the Central region were 23.9% compared to 41.9% from the West region, 250 km from Yaoundé [Fig. 1]. As for residence at the first symptoms, 39.4% resided in the Center and 11.0% in the West and 17.4% in the Littoral located 240 km from Yaoundé [Fig. 4]. The most distant regions of the CBF, that is, Yaounde, are the Far North, 1363 km, the North, 1005 km and Adamaoua, 834 km, with regard to residence at the first symptoms, represented respectively 0.6% 1.3% and 1.9%. The minimum education level of parents in our sample was primary. Secondary education was highest for both fathers and mothers at 45.6% and 50%, respectively. The highest level of education was 33.9% for fathers and 20.9% for mothers.

Clinical features

The first most represented symptoms [Table I] were 39/155 fever (29.2%) followed by abdominal swelling 30/155 (19.4%) and neck mass 18/155 (11.6%). The most represented cancers were, in order of frequency [Table II], lymphomas (29%), followed by leukaemias (28.4%) and nephroblastoma (20.6%) [Fig. 6]. The clinico-biological characteristics [Table III] revealed that the patients surveyed arrived mainly in stage 3 of the disease, ie (51%) followed by stage 4, that is (39.4%).

Table I: Distribution with respect to first symptoms (n= 155)

First Symptom	Number	%
Fever	39	25,2
Abdominal swelling	30	19,4
Neck mass	18	11,6
Tooth ache	13	8,4
Limb pain	8	5,2
Limb swelling	5	3,2
Headache	3	1,9
Swelling of the eye	3	1,9
Movement difficulties	3	1,9
Cat eyes	2	1,3
Weight loss	2	1,3
Others*	29	18,7

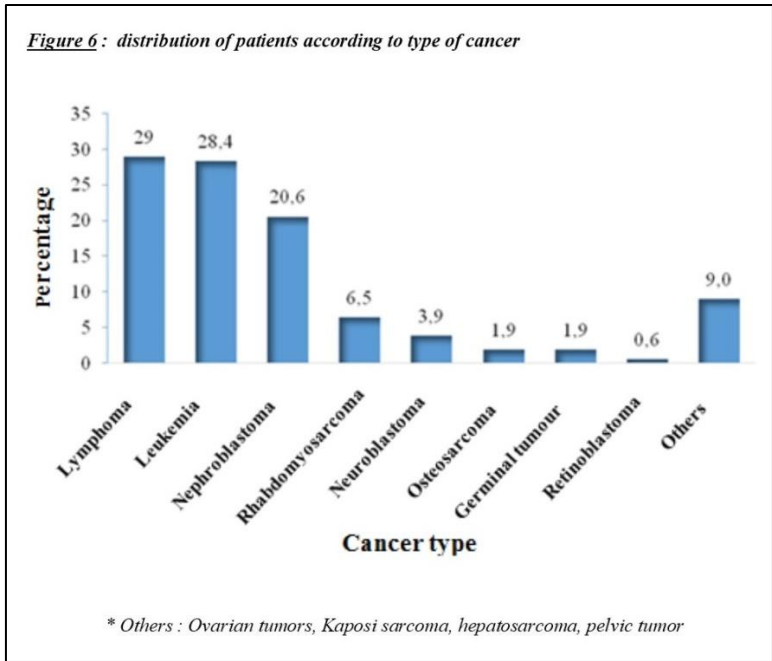
* Others: Anemia, abdominal pain, bloody diarrhea, eruptive skin lesions, hematuria, jaundice, oral mass, paralysis, cough, rectorraghia, jaw swelling,...

Table II: Distribution of the first symptoms with respect to the most frequent cancers (n= 155)

First Symptom	Lymphoma(n = 45)	leukemia (n = 44)	Nephroblastoma/ Wilms tumor (n=32)
Fever	10 (22.2)	15 (34.0)	12 (37.5)
Abdominal swelling	10 (22.2)	5 (11.3)	11 (34.3)
Neck mass	7 (15.6)	5 (11.3)	2 (6.3)
Tooth ache	8 (17.8)	2 (4.2)	0 (0)
Limb pain	0 (0)	3 (6.6)	1 (3.1)
Limb swelling	0 (0)	3 (6.6)	0 (0)
Headache	0 (0)	3 (6.6)	0 (0)
Swelling of the eye	2 (4.4)	1 (2.1)	0 (0)
Movement difficulties	2 (4.4)	1 (2.1)	0 (0)
Cat eyes	0 (0)	0 (0)	0 (0)
Weight loss	0 (0)	1 (2.1)	0 (0)
Others*	6 (13.3)	6 (13.2)	6 (18.8)

Table III: Distribution of patients with respect to the clinical-biological staging on entry (n=155)

Stage at entry	Number	Percentage
1	11	7,1
2	4	2,6
3	79	51
4	61	39,4



Therapeutic itinerary of patients

The median number of resorts before the MCC / CBF was 3 (2 - 4) with a minimum of 1 and a maximum of 15 [Fig. 5]. In our sample 100/155 (64.5%) children were brought for first-referral [Fig. 5] to a doctor, and 44/155 (28.4%) to a nurse. The other health care options were taken by 11/155 (7%) of the patients. Consultations in a public institution involved 91 children (58.7%). The action taken as a first resort was treatment and assessments for 55/155 (35.4%) of the patients. After this first resort, 28 patients were referred directly to the CBF.

One hundred and twenty-seven parents had at least two resorts. Of these, 92 (72.4%) consulted a physician, while 15 (11.8%) referred to a nurse and 20 (15.6%) referred to healers and other remedies. After this second resort, 36 more patients were referred to the MCC / CBF.

Ninety-one parents had at least three remedies (59% of the sample). Of these, 58/91 (63.7%) consulted a doctor, 7/91 (7.6%) a nurse and 26/91 (28.4%) turned to healers and other health options.

In our sample, 50/108 (46.3%) of parents consulted their children in first medical consultation with a general practitioner followed by pediatricians 36/108 (33.3%). The majority of these consultations were in a public institution. The action taken during the first medical consultation was mainly the request for assessment workups 78/108 (47.7%).

The referral of children to the MCC / CBF was made by a physician different from the physician of first resort at the onset of symptoms in 75/155 (48.4%) patients. The explanation of the reason for referral was not made to the parents in 98/155 (63, 2%) of cases. The reason given to the parents was that they were referred to a hospital where their child could be cured. The diagnosis of cancer was not mentioned in any of the cases.

Evaluation of the different deadlines

The average time between the first medical visit and the arrival at the MCC was 7.23 ± 1.2 months. The delay between arrival at the MCC and transfer to the hematology-oncology department averaged 6.54 ± 2.1 days [Table IV]. In total, the mean delay between onset of symptoms and consultation at the MCC hematology-oncology department was 8.3 ± 1.3 months [Table V]. The children who arrived at stages 1 and 2 had an average arrival time of 60 and 77 days, respectively, while those diagnosed at stages 3 and 4 arrived at the MCC at the latest, with an average arrival time of 86 respectively and 158 days.

Table IV: Delay between the onset of symptoms and consultation at the MCC, with respect to first health professional met

First reason for consultation	Average delay in consul-	Standard deviation
Healer	15.5	2.1
Pharmacist	18.7	2.2
Nurse	8.02	1.4
General practitioner	7.7	1.2
Pediatrician	7.2	1.1
Surgeon	10.9	2.3
Another doctor	9.7	1.02

Table V: Delay between the onset of symptoms and consultation at the MCC with respect to the presenting complaint

First presenting complaint	delay in consultation (weeks)	Standard deviation
Fever	10.09	1.8
Abdominal swelling	7.45	1.1
Neck mass	11.7	1.5
Tooth ache	7.9	1.7
Limb pain	2.9	0.3
Limb swelling	3.8	0.5
Headache	3.4	0.4
Swelling of the eye	10.8	0.6
Movement difficulties	1.8	0.1
Cat eyes	18.8	1.1
Weight loss	5.9	0.4
Others*	7.62	0.9

DISCUSSION

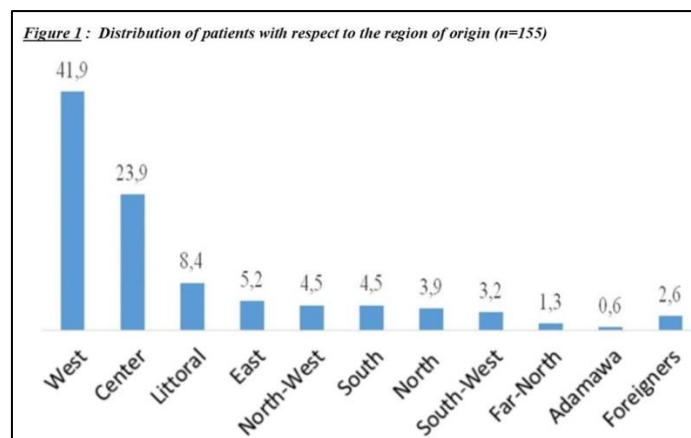
The limitations of this study were that we were not sure that the parents or guardians interviewed were there at the onset of symptoms. Some children who came with their parents did not live with them from the beginning of the illness. And others were rescued from the village by tutors who could not affirm the exact beginning of the disease. In addition, some parents of children interviewed, although present at the onset of symptoms, were reluctant to talk about resorts other than that by health professionals for fear of being stigmatized. The goal of the psychologist in the hematology-oncology department was to strengthen their confidence-building. However, the proportion of resort to healers reported here could be underestimated.

Sociodemographic characteristics

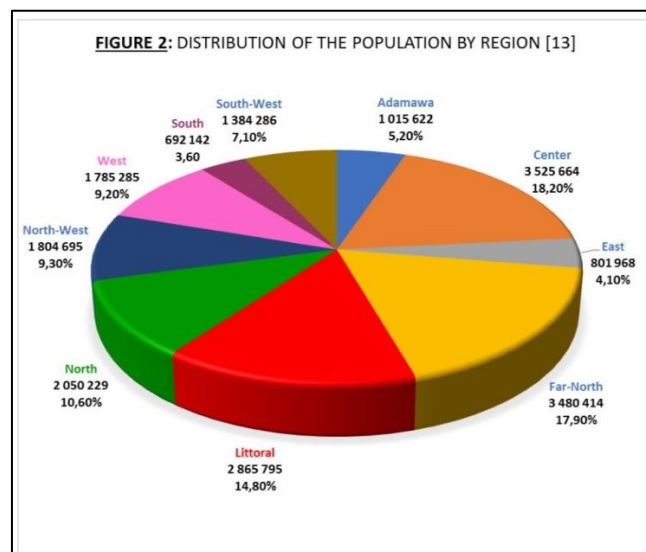
The median age of our study population was 6 years with the extremes of 2 months and 18 years. Our results are similar to those reported by studies in other African countries, including Congo 7.9 years [8] and Nigeria 7.3 years [9].

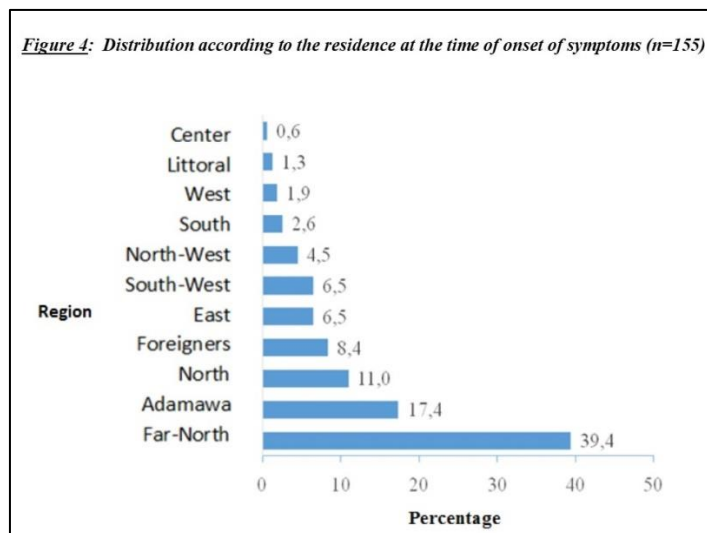
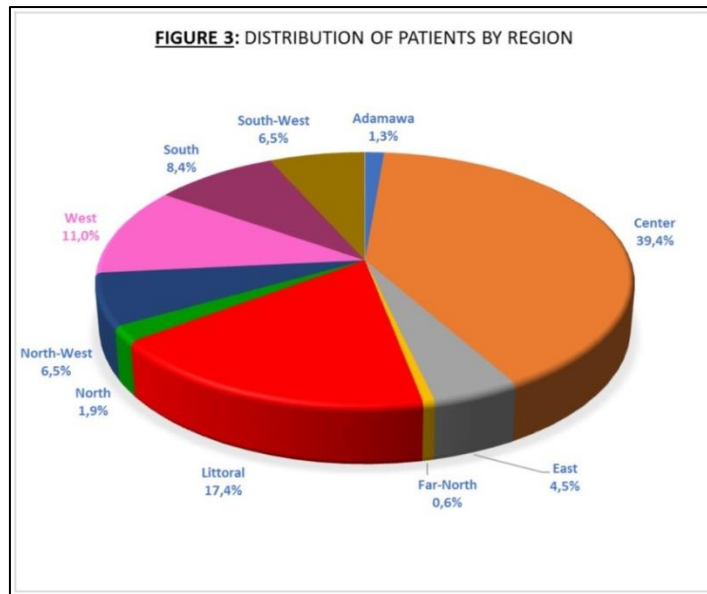
The parents' level of education was higher than primary 82/103 (79.5%) for fathers and 78/110 (70.6%) for mothers. As for the university level, it was 33.9% for fathers and 20.9% for mothers. According to UNESCO in Cameroon, the general literacy rate for over-15s in 2010 was 71.29%, with 78.33% for men and 64.8% for women [10]. Indeed, the importance of educational achievement has attracted the attention of many other researchers, most of whom have come to the conclusion that the use of healthcare services increases with the educational level of parents. This data is in accord with the choice of parents. In our study population, there was no illiterate, which contrasts with studies done in Cameroon in the far north where the literacy rate is the highest. It is clear from our data that the more a person is educated the more one would expect them to have a more rational perception of the disease, and as a result, to resort systematically to modern medicine, especially in the case of severe illness. Thus, according to Fournier and Haddad, as people go to school, one can expect on the one hand a strengthening of the use of modern health care, on the other hand a reduction of the use traditional medicines [11].

The analysis of the region of origin reveals that children from the West are the majority in the selected sample, ie 41.9% [Fig. 1]. They are seconded by the natives of the Central region, with 23.9% of cases. It also appears that patients from the three northern and southwestern regions were the least represented at 5.8% and 3.2%, respectively. Since the MCC / CBF is the only pediatric cancer center in Cameroon, it is cosmopolitan in that it attracts patients coming from all parts of the country and even from countries in the sub-region.



Moreover, when we look at the distribution by region of residence at the beginning of the disease symptoms (Fig 2, Fig 3 and Fig 4), it appears that most of them were in the Center, with a percentage of 39.4%, compared to those in the Far North, 0.6%; Adamaoua, 1.3% and North 1.9%. This situation can be explained by the fact that the populations of the Center benefit from the proximity of the Mother and Child Center. It goes without saying that the difficulties of access to specialized services for populations in remote areas, particularly nationals of the far north of the country, may explain their low representativeness. This conclusion is similar to that of Fournier and Haddad who showed in their study on the accessibility of patients to health facilities, that the longer the distance, the less sick people are motivated to go to health centers [11].





It should be noted that the remoteness of the Far North is not the absolute reason for their under-representation in our sample, given that the regions comprising it, particularly the Far North, the North and Adamawa, are those who have the lowest levels of literacy in the official language (English and French) [12]. Similarly, when comparing the place of residence at the time of the first symptoms and the origin of the children among the residents of the Central Region which is where the MCC is located, children from the Far North are the least represented [Fig. 3].

Clinical features

In our sample, the most represented symptom was fever 39/155 (29.2%). Fever is the response to the release of endogenous pyrogenic mediators called cytokines. It is an uncomfortable symptom that causes parents to react. It does not require treatment in otherwise healthy children. The response to antipyretics and the level of temperature do not have a direct relation with etiology or severity. The most common causes of fevers in children being viral, bacterial or parasitic. This symptom is not specific to cancer and is a source of misdiagnosis. Indeed, as several studies show, fever appears among the first major symptoms of several tropical diseases, notably malaria [13] and tuberculosis [14]. For example, children with recurrent or chronic fevers receive multiple treatments for malaria, antibiotics, and TB treatment when they have respiratory signs or lymph nodes. The same is true for swelling of the abdomen 30/155 (19.4%) children receive several yeasts and intestinal amoebiasis treatment until the mass becomes palpable. The neck mass in 18/155 (11.6%) children was treated with antibiotic for suspicion of abscess. Whether it is swelling of the abdomen or mass of the neck, their diagnosis requires explorations in medical imaging to determine their exact nature. This is not always accessible, given the insufficient technical facilities in some health structures. Also, the interpretation of radiological images has an operator-dependent character. As tumor pathology in children is rare, it is difficult for an untrained technician to diagnose.

Analysis of clinical-biological characteristics revealed that the majority of patients arrived at stage 3 of the disease, 79/155 (51%) followed by stage 4, that is 61/155 (39.4%) [Table VI]. This observation is similar to the results of the study conducted by Togo B *et al.* at Bamako Pediatric Hospital in Mali out of 180 children, according to which the majority of patients had reached stages 3 and 4 in all types of cancer [15]. One study found that in Malawi, which has 6.5 million children under 15, about 900 childhood cancer cases are predictable each year. However, less than 300 cases per year are recorded, which means that two-thirds of children remain undiagnosed, and of the cases diagnosed, the majority are diagnosed at an advanced stage of the disease [16]. The same is true for a study on the state of care in pediatric oncology conducted in Tanzania and Senegal [17, 18], childhood cancer is underestimated.

Table V: Delay between the onset of symptoms and consultation at the MCC with respect to the presenting complaint

First presenting complaint	delay in consultation (weeks)	Standard deviation
Fever	10.09	1.8
Abdominal swelling	7.45	1.1
Neck mass	11.7	1.5
Tooth ache	7.9	1.7
Limb pain	2.9	0.3
Limb swelling	3.8	0.5
Headache	3.4	0.4
Swelling of the eye	10.8	0.6
Movement difficulties	1.8	0.1
Cat eyes	18.8	1.1
Weight loss	5.9	0.4
Others*	7.62	0.9

Moreover, as the literature reveals, the difficulty of late diagnosis of childhood cancer is common to many African countries. We can assume that this arrival at advanced stages might find one of its justifications in the misdiagnosis arising from the non-specificity of the symptoms. Yet, in developed countries, early diagnosis has become a reality and has clearly helped improve child survival over the last twenty years [19, 20].

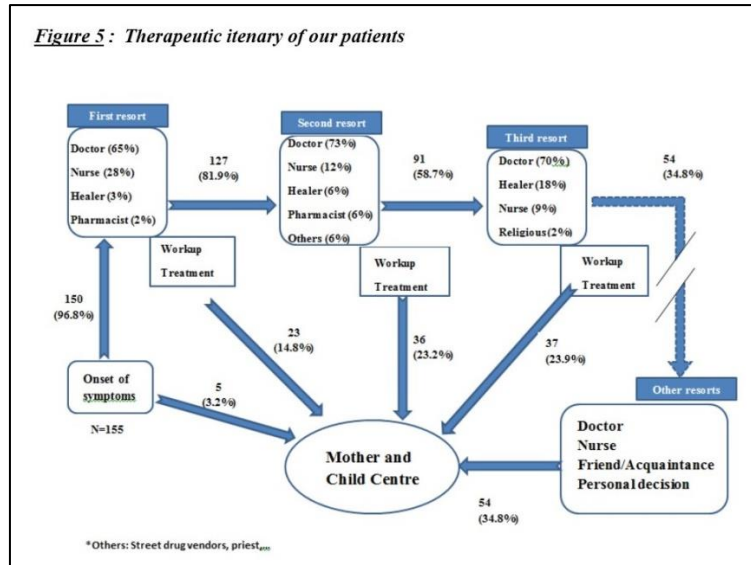
Patient journey before arrival at the MCC

The majority of our patients went directly to modern health facilities: 100/155 (64.5%) first met a doctor; 44/155 (28.4%) a nurse; and only 11/155 (7%) of patients consulted as first option other care trajectories such as traditional healers, churches and street drug dealers.

These results show the high frequency of consultations in health facilities, including general practitioners, the first point of contact with the health care system [Table IV]. In doing so, they differ from the conclusions of the study conducted by Commeyras *et al.* [21] who had highlighted the indecision characterizing the therapeutic behavior of Cameroonian patients. Thus, according to him, the consultation as first option in a health facility is very weak (24%). This difference in data is related to the fact that our work is done on a specific sample consisting of children who have symptoms that have a serious potential such as fever, pain resulting in resorts to health facilities that are able to calm these signs or symptoms quickly [Table V]. Moreover, from a socio-cultural point of view, these signs are related to pathologies known as "hospital diseases" [22].

Moreover, without negating the findings of Commeyras who have based on the general population taking into account all pathologies, in view of our results, we can conclude that in the first resort, despite the influence of parallel medicine, the majority of parents of patients do not question the effectiveness of modern medicine.

When we look at the trajectory followed by our second-line patients, one constant remains: doctors are still mainly resorted to by parents of children, that is 92/127 (72.4%) of cases [Fig. 5]. Nurses are the second most frequent resorts, accounting for 15/127 (11.8%) of the visits. On the other hand, resorts to alternative care-givers (healers, street medicine and church vendors) have increased from 7% to 15.6%. Indeed, as in the study by Commeyras *et al.* [19], the therapeutic routes are very variable and most of the patients change from one healthcare sector to another.



This finding was also found in the study by Diop who found a 35.8% increase in second-line treatment in epileptic patients [17]. As a third resort, it appears that general practitioners are always the first to be consulted: 58/91 (63.7%) while nurses register 7/91 (7.6%). Indeed, all specialists agree that the general practitioner has his place throughout the care of a cancer patient by his presence during screening and diagnosis. In addition, the other health services mentioned above continue to welcome new patients who have abandoned public health facilities 26/91 (28.4%). This willingness to turn to alternative medicine is well recounted by the cured patients who testify: faced with the persistence of the symptoms, after a certain number of consultations, we went (I use their words) to shield the child or to work on the child. This shielding or working on the child aims either to cure or to make the disease come out and become visible to modern medicine. Thus, it could be said that it is the absence of satisfactory responses from caregivers or the etiological beliefs of cancer populations that lead parents to alternative medicine.

From this study, the average time between onset of symptoms and consultation at the MCC hematology-oncology department was 8.3 ± 1.3 months. A similar result is found in Bamako in the work of Togo B *et al.* on the prognosis of pediatric cancers at CHU Gabriel-Touré [15]. These Malian researchers found an average consultation time of 6 months. The association between stage at diagnosis and time to arrive at MCC /CBF shows that children who arrived at stages 1 and 2 had an average arrival time of 60 and 77 days respectively, while those diagnosed at 3 and 4 had an average delay of 86 and 158 days, respectively, with a statistically significant link between the arrival time and the stage of the disease ($P = 0.04$). This data shows that early diagnosis would improve prognosis by increasing the number of stages 1 and 2, and decrease stages 3 and 4 at diagnosis. Diagnostic delays resulting in lateness in the arrival at specialized services. In the health system in Cameroon this lateness could be attributed to: 1) health facilities that do not allow patients to often see the doctor who consulted them, with each new consultation. 2) there is no communication between the health facilities, and the referral and counter referral system is not applied. 3) Families who have non-biomedical ideologies of the disease often use other therapies. Moreover, we can link this lateness to the lack of training of the caregivers who do not have the ability to suspect cancerous conditions in children.

CONCLUSION

Most children had at least three resorts before they arrived at the MCC / CBF. These remedies were preferentially directed to modern medicine, specifically to the general practitioner. Some resorted to traditional healers, churches and street vendors, among others. The western and central regions were the most represented. The most common symptoms were fever, swelling of the abdomen and neck mass. The most common tumors were lymphoma, leukemia and nephroblastoma. Stages 3 and 4 were the most frequent, with a mean delay between onset of symptoms and arrival at the CME of 8 months. Moreover, patients' therapeutic behavior is dependent on individual characteristics reinforced by the socio-cultural context of poverty, education and place of residence. Patients adapt their therapeutic route primarily to their financial means, their geographical access to health facilities and finally to their socio-cultural perception of the disease. Therefore, to reduce as much as possible the influence of these determinants in a better management of childhood cancers, we recommend an awareness of the health staff in the early diagnosis of childhood cancers.

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Les auteurs déclarent ne pas avoir de liens d'intérêts.