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Full Length Research Paper

A pediatric oncology group pilot study on childhood cancers at the Chantal Biya Foundation Yaounde, Cameroon: Report of 350 cases

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Cancer, especially in children is a public health problem in Cameroon. Suspected cases in the centre are biopsied and analysed in the Pathology Service of the Yaounde General Hospital. To find out the clinico-pathologic profile of patients seen at the centre, Clinical and Pathology registers of the two services were reviewed in this retrospective 3 years study from 2005 to 2007 and the data were analyzed. 350 specimens were analyzed in 3 years giving an annual average of 117.78.57% showed malignancy, 13.35% non-neoplastic diseases and 8.08% benign tumours. 55.7% were males, against 44.3% females. The predominant age group in both sexes was 5 to 14 years with peak at 5 to 9 years. The main diagnosis were Burkitt's lymphoma (40.86% of Acute lymphocytic leukemia (ALL) diagnosis, 52% of all malignancies and 54.79% of lymphomas). It is localised in the maxilllo-facial region (71%), abdomino-pelvic organs (17%) and eye (5%). Non Hodgkin lymphoma (NHL) (38.91%) was second commonest and the predominant type of NHL is non-Hodgkin's lymphoblastic lymphoma (26.29%). Among the cancers are rare malignancies that include nephroblastomas (0.73%), neuroblastomas (0.36%), Kaposi sarcoma (1.09%) hepatocellular carcinoma (0.36%) and soft tissue sarcomas (1.82%). Diagnosis was by fine-needle aspiration cytology (97.5%). The study reveal that childhood tumours are not rare in Cameroon. The commonest pathology seen at the Haemato-Oncology Service of the Chantal Biya Foundation is a lymphoma, mainly a Burkitt's. Late and adolescent childhood age groups are mostly affected. The pilot centre statistics reflect trends and patterns of pediatric cancers nationally. More indepth studies are recommended.

Key words: Acute lymphocytic leukemia (ALL) diagnosis, Cameroon, childhood cancers.

INTRODUCTION

In Africa, and Cameroon in particular, statistics on childhood malignancies are rare and fragmented (Lemerle et al., 2003). Malignant disease has been recognised in the past decades as a public health problem in near equal proportions to infectious diseases and malnutrition in developing countries (Abondo et al., 1994). In Cameroon, a sub-saharan country in the Central African sub-region, there have been many studies on neoplastic diseases. In most of the studies, lymphoproliferative malignancies in general and Burkitt's lymphoma in particular have been cited as predominant, especially in the children (Mbakop et al., 1996). The Groupe Franco-Africaine d'Oncologie pediatrique (GFAOP) Yaounde Pilot Centre in the Chantal Biya Foundation is a specialized pediatric oncology structure that serves as referral for childhood malignancies from all over Cameroon and the sub-region.

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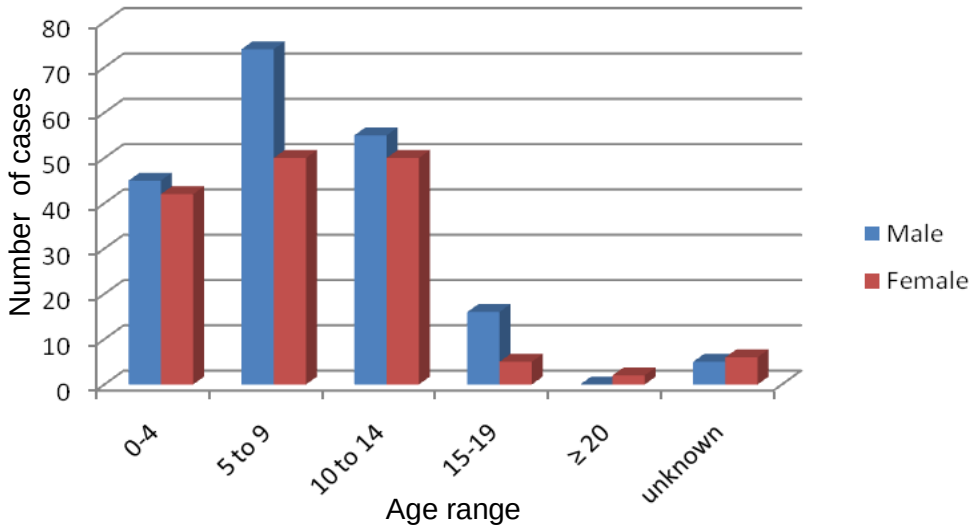

Figure 1. Age distribution by sex of cases seen at Chantal Biya Foundation between 2005 and 2007.

MATERIALS AND METHODS

Data from the registers of the Haemato-Oncology Service in the Chantal Biya Foundation Pilot Centre and the Pathology Service of the Yaounde General Hospital were consulted between 2005 and 2007. All patients with microscpically confirmed childhood cancers were recruited. The clinical and pathological data was analyzed. All cases out of the study period were rejected.

RESULTS

350 specimens were analyzed in 3 years giving an annual average of 117.78.57% showed malignancy, 13.35% non-neoplastic and 8.08% benign. 55.7% were males, against 44.3% females. The predominant age group in both sexes was 5 to 14 years with peak at 5 to 9 years. Main diagnosis were Burkitt's lymphoma at 40.86% of Acute lymphocytic leukemia (ALL) diagnosis, 52% of all malignancies and 54.79% of lymphomas. The tumour is localised in the maxilllo-facial region (71%), abdomino-pelvic organs (17%) and eye (5%) (Figure 2). Non-Hodgkin's (NH) lymphoma was the second commonest finding (30.6% of ALL diagnosis, 38.91% of all malignancies and 43% of lymphomas). In this last category NH lymphoblastic lymphoma (26.29%) was the commonest type. Rare malignancies include nephroblastomas (0.73%), neuroblastomas (0.36%), Kaposi sarcoma (1.06%), hepatocellular carcinoma (0.36%) and soft tissue sarcomas (1.82%). Diagnosis was by fine-needle aspiration cytology (97.5%).

Both non-Hodgkin's (NH) and Burkitt's lymphoma (BL) lymphomas are more prevalent in male than female children in late and adolescent childhood (> 5 years). BL is more common in males in late childhood (5 to 9 years), while NHL is more prevalent in the adolescent male compared to females of same age (14 to 19 years). In early childhood (<5 years), NHL and BL have no sex predeliction. Generally, BL is a disease of early childhood, while NHL is a disease of late childhood to adolescence. The incidence of both NHL and BL falls sharply after 10 years and decreases exponentially to 20 years.

DISCUSSION

Specimens from 350 patients in the GFAOP Yaounde Pilot Centre were analyzed in 3 years at the Pathology Service of the General Hospital Yaounde, giving an average incidence of 117.78.57% of the specimens analysed showed a malignant lesion. This is higher than reports from previous studies in this population (Abena Obama et al., 1989). Generally, pediatric malignancies show a slight male predominance (55.7%) in our series, similar to findings in earlier reports (Mbakop et al., 1996) (Figure 1). The patients were mainly children below 14 years (90.29%), and the predominant age group involved in both sexes was 5 to 14 years with peak at 5 to 9 years (43.41%) (Mbakop et al., 1996). The diagnosis was microscopically confirmed mainly by Fine-Needle Aspiration Cytology (FNAC) (97.5% against 2.5% by histology). No post-biopsy complication was reported. FNAC has been reported to be a cheap, rapid, non-invasive and reliable diagnostic method for tumour diagnosis in low-resource communities like ours (Brown and Coghill, 1992). The average duration of hospitalization of the patients was 14 days and only 8.0% of the patients had a post-therapeutic control FNAC. Malignant non-Hodgkin's lymphoma is the main childhood cancer in our community. The commonest type

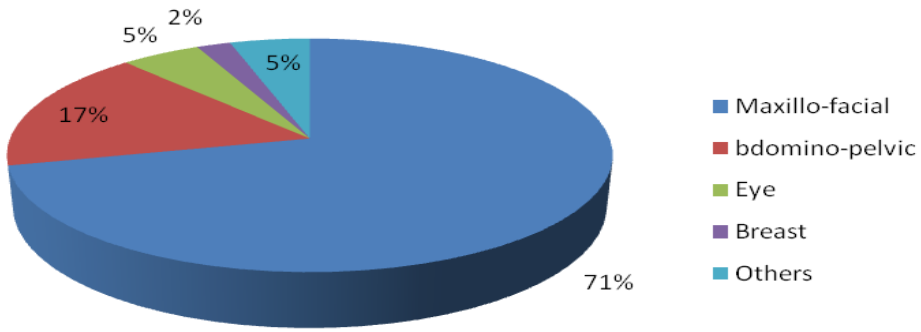

Figure 2. Localisation of Burkitt's lymphoma.

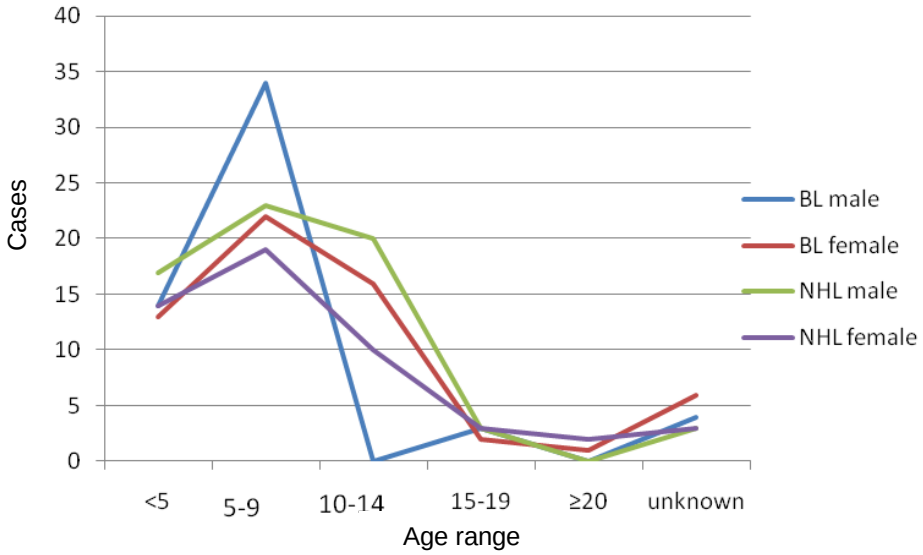

Figure 3. Distributon of BL and NHL by age and by sexes.

is Burkitt's lymphoma-BL (40.86% of all cases and 54.79% of lymphomas). It is predominant in the 5 to 9 years age range. Generally, and in each age group, BL is numerically more common in males than females, though with no statistically significant sex predilection (Figure 3). Lemerle et al. (2003) reported that BL is the most frequent cancer in children in subsaharan Africa, more than leucemias, and its preponderance in malaria endemic zones and relationship with Ebstein-Barr virus are established. They estimated about 8 to 12.000 new cases in 2004. The tumour is mainly localized in the maxilllo-facial region (71%), abdomino-pelvic organs (17%) and eye (5%). These findings were reported in some studies (Burkitt and O'connor, 1961) though others (Belly-Priso et al., 1999) observed an increasing abdomino-pelvic localization of the tumour especially in females.

The second most common tumour is NHL, particularly non-Hodgkin's lymphoblastic lymphoma (26.29% of all cases and 35.25% of all lymphomas). Other types of non-Hodgkin's lymphomas are rare (Table 2). Hodgkin's disease is not common in our study, accounting for only 2.80% of all lymphomas and 2.16% of all malignant lesions amongst the patients (Tables 1 and 2). This observation has been reported by Mbakop who observed that Hodgkin's disease is rare in both adults and children in Cameroon (Mbakop et al., 1991). Other rare malignancies in our series include nephroblastomas (0.73%), neuroblastomas (0.36%), Kaposi sarcoma (1.09%), hepatocellular carcinoma (0.36%) and soft tissue sarcomas (1.82%) (Table 1). This prevalence has been reported in earlier studies on this population. Although hepatoblastoma has been reported to be a common childhood liver tumour (Ishak and Glunz, 1967), in our series, hepatocellular carcinoma is more common, with a cytology similar to that found in adults (Weinberg and Finegold, 1983).

NH and BL show interesting trends among the various age groups in the 2 sexes. Both are more prevalent in male than female children in late and adolescent

Table 1. All malignant tumours by sex.

Diagnosis	Male	Female	Total cases	%
Hodgkin's lymphoma	3	3	6	2.18
Other NHL	61	46	107	38.91
Burkitt's lymphoma	79	64	143	52.00
Unspecified lymphoma	2	3	5	1.82
Nephroblastoma	1	1	2	0.73
Adenocarcinoma	1	1	2	0.73
Neuroblastoma	1	0	1	0.36
Hepatocellular carcinoma	1	0	1	0.36
Kaposi sarcoma	2	1	3	1.09
Soft tissue sarcoma	3	2	5	1.82
Total	154	121	275	100

Table 2. Distribution of lymphoma type by sex.

Diagnosis	Male	Female	Total cases	%
Burkitt	79	64	143	54.79
Lymphoblastic	52	40	92	35.25
Centroblastic	3	1	4	1.53
Lymphocytic	1	1	2	0.76
Lymphocytic/lymphoblastic	5	2	7	2.68
Lymphoma/leukemia	0	1	1	0.38
Hodgkin	3	3	6	2.30
Histiocytic	0	1	1	0.38
Unspecified	2	3	5	1.93
Total	145	116	261	100

Table 3. Non-malignant diagnosis by sex.

Diagnosis	Male	Female	Total	%
Leishmaniasis	0	1	1	1.6
Tuberculosis	4	4	8	12.9
Other Benign tumours	10	5	15	24.2
Reactive/inflammatory adenitides	17	10	27	43.6
Others	8	3	11	17.7
Total	39	23	62	100

childhood (>5 years). BL is more common in males in late childhood (5 to 9 years), while NHL is more prevalent in the adolescent male compared to females of same age (14 to 19 years) In early childhood (<5 years), NHL and BL have no sex predeliction (Figure 3). Generally, BL is a disease of early childhood, while NHL is a disease of late childhood and into adolescence. The incidence of both NHL and BL falls sharply after 10 years of age and decreases exponentially to 20 years in both sexes (Figure 3). These trends have been observed in past studies (Parkin et al., 1998). About 13.35% of all diagnosis in our study are non-neoplastic conditions like reactive or non-specific inflammatory adenitides and tuberculosis. In 8.08%, the disease was a benign tumour (Table 3).

Conclusion

Childhood tumours are not rare in Cameroon. The commonest pathology seen at the GFAOP Chantal Biya Foundation Pilot Centre is cancer, mainly NHL, and

predominantly a Burkitt's lymphoma. Other childhood cancers are rare. Late and adolescent childhood are the most commonly affected age group. At an annual incidence of 117, the centre receives pediatric oncology cases more than anywhere in the country. For their proper management, Fine Needle Aspiration Cytology has proven to be a reliable diagnostic procedure which not only distinguishes inflammatory from neoplastic but also between benign and malignant lesions. Further studies are recommended to find out trends in incidence, prevalence and disease outcome.

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