



## **Occurrence of Burkitt's Lymphoma among All Childhood Tumors Seen in Abia State University Teaching Hospital ABA, South East Nigeria (11 Years Retrospective Study)**

**H. N. Chineke<sup>1</sup>, P. O. U. Adogu<sup>2\*</sup>, K. C. Diwe<sup>1</sup>, C. O. Emerole<sup>1</sup> and M. U. Ewuzie<sup>3</sup>**

<sup>1</sup>Department of Community, Medicine Imo State University, Teaching Hospital Orlu, Nigeria.

<sup>2</sup>Department of Community, Medicine Nnamdi Azikiwe University, Teaching Hospital Nnewi, Nigeria.

<sup>3</sup>Department of Paediatric, Surgery Imo State University, Teaching Hospital Orlu, Nigeria.

### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author HNC designed the study, wrote the protocol and wrote the first draft of the manuscript. Author POUA managed the literature searches supervised the data collation, analyses and subsequent manuscript write up. Author KCD was involved in data collection, collation and literature review. Author COE helped in review of the patient's folder while Author MUE facilitated the ethical clearance and consent read through the manuscript and made some corrections. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Background:** Burkitt's lymphoma (BL) is the commonest tumour in Africa. It is a rapidly growing tumour. Its multi-organ involvement and complexity of signs and symptoms, call for an urgent diagnosis and treatment to achieve a better prognosis.

**Objective:** To determine the occurrence of BL, a childhood tumour, in Abia State University Teaching Hospital in the years 2000 to 2010.

**Methodology:** It was a descriptive cross sectional survey in which the case files of all the patients who presented at the paediatric clinic, children emergency room, ward and cancer registry for BL cases between January 2000 and December 2011 were evaluated. The BL occurrence was

\*Corresponding author: Email: [prosuperhealth@yahoo.com](mailto:prosuperhealth@yahoo.com);

manually worked out as the percentage of confirmed BL cases in relation to the total number of childhood tumours seen within that period.

**Results:** The occurrence of BL (among the 40 pediatric cancer cases) was 65%, meaning that it was more common than the other childhood tumours seen within the same period. It was also commoner in males than in females, and also more in the lower socio-economic class than in the middle and upper socio-economic classes as assessed by the occupation of the parents of the patients.

**Conclusion:** BL is a common childhood tumour in the tropics more commonly seen among the lower socio-economic group. Efforts should be made by caregivers to identify the disease in time for early treatment and follow-up because BL responds well to aggressive chemotherapy when started early.

*Keywords: Occurrence; burkitt's lymphoma; childhood tumors Abia State University.*

## 1. INTRODUCTION

Burkitt's lymphoma (BL) is the commonest childhood tumour in tropical Africa [1]. It was named after Dennis Parson Burkitt, who mapped out its peculiar geographical distribution across Africa in 1958. It is one of the fastest growing malignancies in humans, with the highest incidence in Equatorial Africa and Papua New Guinea [2]. Within Africa, there is an uneven geographical distribution of BL which led Dalldorf in 1962 to suggest that malaria may be a risk factor for lympho-malignancies especially BL [3,4].

It is known that repeated attacks of malaria in early childhood gives rise to depression of cellular immunity and this may play a role in the development of a tumour [5]. In the African form, the host is believed to be unable to mount an appropriate immune response to primary Epstein-Barr virus possibly due to co-existence with malaria or another infection that is suppressive. Months to years later, excessive B-cell proliferation occurs. There is a strong correlation between residents in areas of intense malaria transmission, and the incidence of BL [6,7]. In countries such as Kenya, Epstein Barr virus infections generally occur by two years of age and persist for life as memory cell [8-12]. The virus is periodically shed in saliva suggesting that there is lytic cycle reaction [13].

## 2. MATERIALS AND METHODS

### 2.1 Study Area

The study was conducted at Abia State University Teaching Hospital (ABSUTH) Aba, South Eastern Nigeria. It is a tertiary health facility care centre which provides undergraduate

training for medical students as well as post graduate training for resident doctors. Its catchments areas include Abia, Imo, Ebonyi, Akwa-ibom and River states.

### 2.2 Study Population

The study population consisted of all cases of childhood tumours who presented at clinics, wards, cancer registry or children emergency room of the ABSUTH from January 1<sup>st</sup> 2000 to December 31<sup>st</sup> 2010.

### 2.3 Study Design

It was a cross-sectional retrospective descriptive study.

### 2.4 Study Population

The number of all pediatric patients managed for various childhood diseases within the period under review was 52,800. There are approximately 352,000 children in the catchment area.

### 2.5 Method of Tumour Diagnosis/ Number of Cases per Year

Diagnosis of BL was made based on clinical history/presentation and the discovery of starry-sky appearance during histological examination of biopsied lymph node specimen. The number of cases per year includes; from 2000 to 2002 there were 2 cases per year, 2003 had 4 cases, 2004 had 8 cases, 2005 had no case, 2006 had 3 cases, 2007 had 2 cases, 2008 had no case, 2009 had 2 cases and 2010 had 1 case. This gives a total of 26 cases seen within the 11- year study period (2000 -2010).

## 2.6 Data Collection

Data was collected from the case files of all pediatric patients managed for childhood tumours within the period of study. The data collected were patients' bio-data, occupation of parents/guardian, treatment modalities and year of presentation.

## 2.7 Sample Size

Within the study period, 40 cases of childhood tumours were seen, out of which 26 were BL.

## 2.8 Data Analysis

Data was analyzed and presented using descriptive statistical methods: frequency tables and bar charts.

## 2.9 Ethical Consideration

Permission was obtained from the Ethics Committee of the ABSUTH prior to the commencement of this research.

## 2.10 Limitation of Study

Retrieval of patients' case notes was a bit difficult due to poor filing and arrangement.

## 3. RESULTS

Forty tumors were detected in children  $\leq 12$  years of age. BL and leukemia accounted for 90% of the childhood tumors (Table 1). The prevalence of BL among all children with tumors was 65% (26 of 40 children). BL was detected more often in males than females [18(69.2%) versus 8 (30.8%), respectively]. The male to female ratio was 2.3:1. The most (46.2%) number of cases (12 of 26) occurred in children ages 6-7, while the least (3.84%) number of cases (1) occurred in children age 12 (Fig. 1). The most common presenting symptom was jaw swelling which was observed in 20 of the 26 (77%) BL children (Table 2). Weight loss, toothache, fever and abdominal swelling were observed in 20-30% of children. Notably, 16 of 26 children (61.5%) were from lower socio-economic families, while 10 belonged to the middle socio-economic families.

## 4. DISCUSSION

The study showed that the mean age of presentation of children with BL in Abia State

University Teaching Hospital was 7 years. This approximately corresponded with the results obtained at Obafemi Awolowo University Teaching Hospital Ile-Ife Osun State South Western Nigeria, and Usman Danfodio University Teaching Hospital Sokoto North Western Nigeria where the values of 5-9 years (average 7 years) were obtained [14].

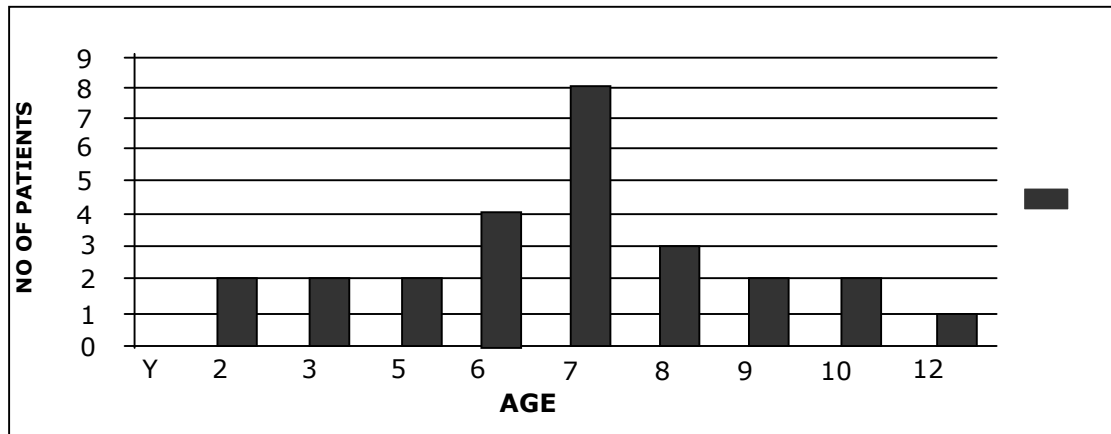
BL made up 65% of all childhood tumors seen in ABSUTH. This was in contrast to the 22.4% obtained at Lagos State University Teaching Hospital [15]. However, a more comparable result of 60% was obtained at Ebonyi State University Teaching Hospital (EBSUTH) Abakaliki [16]. The differences in the results from these centers may have been due to poor medical record keeping, wrong diagnosis, high level of illiteracy and/or indifference to orthodox medical facility utilization by the people in the various communities.

In ABSUTH, jaw swelling was the commonest presenting feature (77%). This result was almost similar to that obtained at Lagos State University Teaching Hospital Ikeja where 78.5% of patients presented with jaw swelling. In contrast, abdominal swelling was the most preponderant feature at EBSUTH Abakaliki South Eastern Nigeria [15]. The differences could be as a result of poor medical recording or wrong diagnosis at the various centers. Notably, 2 of our children (7.7%) presented with pallor signifying anaemia suggesting BL could lead to haematological disturbances manifesting as anaemia. This finding was consistent with the report from Ahmadu Bello University Teaching Hospital Zaria, Kaduna State North Central Nigeria citing a significant relationship ( $p < 0.05$ ) between BL and anaemia [17].

The study results also revealed a male preponderance (male to female ratio of 2.3:1) similar to the results obtained from University of Port Harcourt and EBSUTH Abakaliki which recorded male to female ratios of 2:1 and 2.1:1, respectively [15,16]. It was also discovered that more children of families in the lower socio-economic class (62%) were affected followed by the middle class (38%). The unaffected children from the high socio-economic class could be as a result of higher standard of living, preventive and curative measures against the predisposing factors of the disease like malaria, Epstein-Barr virus and HIV infections.

**Table 1. Proportions of childhood tumour seen within 2000-2011**

Type	Frequency	Proportion (%)
Burkitt's lymphoma	26	65
Leukaemia	10	25
Non Hodgkins	3	7.5
Retinoblastoma	1	2.5
<b>Total</b>	<b>40</b>	<b>100</b>



**Fig. 1. Bar chart on age distribution of cases.**

**Table 2. Presenting features**

Presenting features	Frequency	Percentage %
Abdominal swelling	6	23.1
Jaw swelling	20	77
Weight loss	8	30.8
Fever	6	23.1
Pallor	2	7.7
Toothache	6	23.1
Decreased appetite	2	7.7
Vomiting	2	7.7
Difficulty in swallowing	2	7.7
Dental Anarchy	2	7.7
Hepatosplenomegaly	2	7.7

**5. CONCLUSION**

This retrospective study has shown that BL accounted for 65% of all cases of child hood tumours in Abia State University Teaching Hospital over an 11 year period. It is therefore the commonest pediatric tumour in this area. Generally, BL presented as jaw swelling, affected more male than female children usually 6-7 years of age from families of the lower and middle socio economic classes.

**6. RECOMMENDATION**

Efforts should be made by health care givers to identify the disease on time for early treatment

and follow up because this tumour responds positively to aggressive chemotherapy when started on time. Early detection can be enhanced through aggressive dissemination of the right information concerning the disease.

**CONSENT**

All authors declare that informed consent which constituted part of the ethical clearance, was obtained from the hospital records department for publication of this case report. Also the patients' direct care giver took part in the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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