

# Pattern of childhood malignant tumors at a teaching hospital in Kano, Northern Nigeria: A prospective study

## Original Article

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### Abstract

**BACKGROUND:** Childhood cancers represent an important global public health problem. Survival is still dismal in most low income countries. **MATERIALS AND METHODS:** A prospective study of childhood cancers diagnosed at AKTH, Kano was undertaken from January 2003 to December 2009 to determine the pattern, socio-economic and geographical features. **RESULTS:** Malignant lymphomas constituted 46.5% of all cases, of which 30.1% were Burkitt's lymphoma, 9.8% were Non-Hodgkin (non Burkitt's) lymphoma and 6.6% were Hodgkin lymphoma. Retinoblastoma was the second most common malignancy constituting 15.2% of all cases, followed by Nephroblastoma 12.5% and acute leukemia's accounted for 14.1% of all cases. Others were Neuroblastoma 5.5%, Rhabdomyosarcoma 1.9% and CNS and Hepatisc tumors 4.3%. About 80% of parents of these children are very poor and could not afford the cost of treatment. Fifty one percent of the patients were alive at 12 months and the mortality was 24%. **CONCLUSION:** Childhood cancer is common in Kano. Free treatment is what is required since majority of the parents could not afford the cost of treatment.

**Key Words:** Childhood, malignant tumors, pattern

### Introduction

Cancer in children is a small fraction of the global cancer burden. Yet for children with cancer and their families it can be very distressing.<sup>[1]</sup> This is especially so in poorer countries, where childhood cancer too often is detected too late for effective treatment and where appropriate treatment is either not available or not affordable.<sup>[1]</sup> Many children are never diagnosed at all, many are diagnosed very late, and when a diagnosis is made the treatment options may be limited.<sup>[1]</sup>

The extent of childhood malignancies in Nigeria has largely been studied from retrospective analysis, often with incomplete data. This study was carried out to determine the prevalence of childhood malignancies and the associated clinical, socio-economic and geographical features at Aminu Kano Teaching Hospital Kano, northern Nigeria.

### Materials and Methods

A prospective study of childhood cancers diagnosed at AKTH, Kano was undertaken from January 2003 to December 2009. A proforma was used for each histologically confirmed case. The information recorded included demographic information (name, age, sex, address, and ethnicity), presenting complaints and duration of illness. The family type, income and educational attainment of the parents, the diagnostic methods (cytology/histology), localization and the clinical stage, as well as outcome at 12 months were also recorded on the study proforma.

### Results

Two hundred and seventy six children were admitted with various types of malignancy over the seven year period, which accounted for 2.7% of total admissions of 9554 into the children's emergency and pediatric wards over the study period. Their ages ranged from 7 months to

15 years. There were 152 males and 104 females, with a male to female ratio of 1.5:1. Lymphomas were the most prevalent malignancy constituting 46.5% of all malignancies. Of these, 30.1% were Burkitt's lymphoma, 9.8% Non-Hodgkin's non Burkitt's lymphoma and 6.6% Hodgkin's lymphoma. Retinoblastoma was the second most common tumor constituting 15.2% of all malignancies followed by Nephroblastoma which accounted for 12.5% of malignancies. Acute lymphoblastic leukemia accounted for 8.6%, while acute myeloid leukemia constituted 5.5%. Neuroblastoma accounted 5.5%, Rhabdomyosarcoma 1.9% and others (CNS, Hepatic, and CML) 4.3% of all malignancies seen during the study period [Table 1].

After confirmation of the diagnosis, initial treatment preparations for all patients included patient/parental counseling on the nature of the disease, treatment options and financial implication, treating any inter current infections, as well as correcting anemia and/or thrombocytopenia with packed red cell and/or platelet concentrates administration of allopurinol and cotrimaxazole. Patients were also commenced on hyper hydration with 2-2.5 liters of 4.3% dextrose in 0.18 saline and anti-emetics 24 hours before chemotherapy. The outcome of treatment at 12 month Figure 1 showed that 131 patients (51.2%) were disease free. Out of this, 6 (4.6%) were patients with ALL and 125 (46.6%) were patients with solid tumors who have completed 6 courses of cytotoxic chemotherapy. These comprises of 52 (39.7%) Burkitt's lymphoma, 16 (12.2%) non Hodgkin's lymphoma, 17 (13.0%) Hodgkin's lymphoma, 11 (8.4%) nephroblastoma, 6 (4.6%) each of ALL and neuroblastoma, 2 (1.5%) rhabdomyosarcoma and 3 (2.3%) patients with Juvenile CML.

Patients were mostly from Kano and other neighboring state. With respect to the parent's educational attainment, 45% were illiterate and only 3.5% had tertiary education [Table 2]. Families were of monogamous marriages in 138 (58.5%) and polygamous in 98 (41.5%). The family income disposition [Table 3] showed that about 80% of parents of these patients earned less than two US dollars per day and could not afford the cost of treatment. The outcome at 12 month showed that 51.3% were alive with a mortality of 24%. Abandonment of treatment due to

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**Table 1: Types of malignancy observed in study patients**

| Diagnosis                         | Frequency |         | Total | Percentage |
|-----------------------------------|-----------|---------|-------|------------|
|                                   | Males     | Females |       |            |
| Lymphomas                         |           |         |       |            |
| Burkitt's lymphoma                | 46        | 31      | 77    | 30.1       |
| Non Hodgkin's lymphoma            | 11        | 14      | 25    | 9.8        |
| Hodgkin's lymphoma                | 14        | 3       | 17    | 6.6        |
| Retinoblastoma                    | 16        | 23      | 39    | 15.2       |
| Nephroblastoma                    | 17        | 15      | 32    | 12.5       |
| Acute lymphoblastic leukemia      | 20        | 2       | 22    | 8.6        |
| Acute myeloid leukemia            | 7         | 7       | 14    | 5.5        |
| Neuroblastoma                     | 10        | 4       | 14    | 5.5        |
| Rhabdomyosarcoma                  | 3         | 2       | 5     | 1.9        |
| Others (CML, CNS, Hepatic tumors) | 8         | 3       | 11    | 4.3        |
| Total                             | 152       | 104     | 256   | 100        |

**Table 2: Parental educational attainment**

| Education       | Frequency | Percentage |
|-----------------|-----------|------------|
| Illiterate      | 115       | 45.0       |
| Primary/Quranic | 94        | 36.7       |
| Secondary       | 38        | 14.8       |
| Tertiary        | 9         | 3.5        |
| Total           | 256       | 100        |

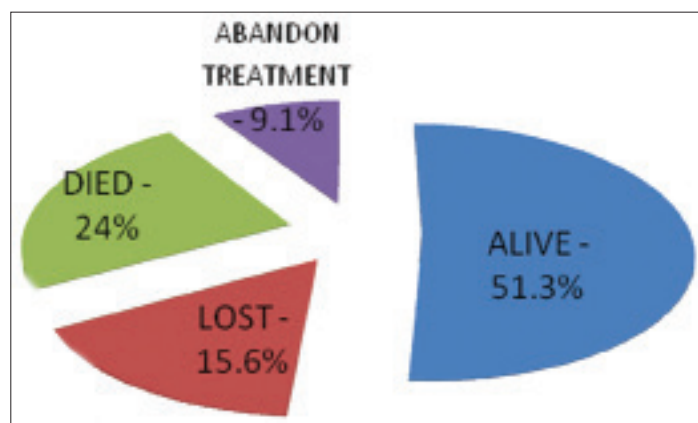
**Table 3: Monthly family income disposition**

| Income category | Frequency | Percentage |
|-----------------|-----------|------------|
| <60 USD         | 203       | 79.3       |
| 60-120 USD      | 28        | 10.9       |
| 120-180 USD     | 14        | 5.5        |
| >180 USD        | 11        | 4.3        |
| Total           | 256       | 100        |

inability to pay for treatment was observed in 9.1% and 15.6% were lost to follow up [Figure 1].

## Discussion

Lymphomas were the most prevalent childhood malignancy in Kano, Nigeria with Burkitt's lymphoma being the most common childhood cancer constituting 30.1% of the total. This finding was very similar to reports from most part of Africa,<sup>[2-9]</sup> but different from reports from developed countries where leukemia's and intra cranial tumor predominate in children.<sup>[10]</sup> However, report by Ojesina *et al.*,<sup>[11]</sup> from Ibadan reported a significant relative decline in the frequency of Burkitt's lymphoma which was ascribed the relative decline to the improved living conditions and greater control of malaria. In this study, retinoblastoma was the second commonest tumor accounting for (14.8%) of total malignancies, followed by nephroblastoma and acute leukemia's. This finding is similar to reports from other centers where retinoblastoma and nephroblastoma were relatively common.<sup>[2,11,12]</sup> However, report from Jos,<sup>[13]</sup> north central Nigeria showed that acute leukemia constitute a major childhood cancer, while retinoblastoma and nephroblastoma were uncommon. These



**Figure 1: Outcome of treatment at 12 months**

findings suggests that there are variations in prevalence of retinoblastoma and leukemia in different parts of Nigeria or that leukemia is now more common even in Nigeria where it had earlier been reported to be rare.<sup>[12]</sup> Wessels *et al.*,<sup>[14]</sup> equally reported that CNS tumors and leukemia were common childhood cancer in Namibia. It was also observed in this study that CNS tumors were uncommon and no cases of bone cancer were recorded. This is probably because all cases of bone tumors were directly referred to national orthopedic hospital in the state. Ethnic and geographic variations in the distribution of different types of childhood malignancies may be attributed to the interplay of varied causative factors such as exposure to ultraviolet light, chemical carcinogens, oncogenic viruses, genetic factors and cultural practices among various populations.<sup>[15,16]</sup> With changes in diet, worsening pollution, ageing populations, rising obesity rates, tobacco use, and alcohol intake, developing countries are now saddled with more non-communicable diseases including heart problem, strokes diabetes and cancer in addition to infectious diseases.<sup>[17]</sup> In this study, the mortality rate of 24% compares favorably with reports from other Centre's,<sup>[11,13]</sup> although accurate assessment is made difficult by a high default rate.

Many families of children with cancer experience financial difficulties. In developed countries, for many patients a portion of the medical expenses is paid by their health insurance plan. For individuals without health insurance or who need financial assistance to cover care costs, resources are available, including government sponsored programs and services supported by voluntary organizations.<sup>[18]</sup> On the other hand, in resource poor countries where health insurance and resources to help families with children with malignancies through financial difficulties are virtually nonexistent. In this study, majority of our patients came from very poor families with about 80% of parents of these children earning less than 2 USD per day and this is above the national average poverty rate of 71.1%,<sup>[19]</sup> for the north-western Nigeria. The parents of these patients have to bear all the costs of treatment including drugs, diagnostic investigations, meals etc. This contributes to late presentation, high default rates and poor compliance to treatment and eventual high morbidity and mortality. Most childhood cancers can be cured or a long-term remission achieved if prompt and essential treatment is both accessible and affordable. In this study, the high

parental illiteracy rate of 45% which is although lower than 52.9%<sup>[20]</sup> overall illiteracy rate for the region, but may have significantly contributed late presentation and eventually poor outcome. The level of education will depend on how much information the parents can access to assist them to understand their children's disease and its treatment.

Alliances between public, private, and international agencies might rapidly improve the outcome of children with cancer in low-income countries.<sup>[21]</sup>

## Conclusion

Childhood malignancies were common in Northern Nigeria and were major contributors to morbidity and mortality in children. Ignorance, poverty and late presentation were the major contributors to poor outcome. Training of qualified personnel, better public information and the involvement of local governments in more active public health policies are key drivers of improving childhood cancer survival in developing countries.

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## News

**Next APLCC meeting will be held in Kuala Lumpur from 6-8 November 2014.**  
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## News

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