ORIGINAL ARTICLE

A PATHOLOGY FREQUENCY STUDY OF CHILDHOOD SOLID CANCER IN SOKOTO.

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SUMMARY

Background and objective: Childhood cancer, a rising problem in Nigeria, has received little or no attention in the past. We describe the pattern and distribution of cancer in children in Sokoto, Northwestern Nigeria, to increase awareness on the diseases and highlight their prevalence.


Methodology: All cases of paediatric cancers diagnosed in the period reviewed using the signed-out histology and cytology reports, microscopic slides and paraffin blocks of patients' biopsies that had been stored serially on a yearly basis. Demographic information was collected on each patient included in the study. The results were tabulated and analyzed and are presented in form of simple frequency table and bar chart.

Results: 158 cases of pathologically diagnosed childhood cancers were analyzed. The peak age was in the 5-9 years age group with a slight male preponderance. The highest frequencies were observed for Burkitt’s lymphoma and retinoblastoma. Tumours of brain and bone were rare.

Conclusion: The pattern of paediatric cancer is comparable with that previously reported in other regions of Nigeria and confirms the general impression that these malignancies are under diagnosed in our own environment. This study further highlights the need for the provision of modern facilities for early childhood cancer detection, diagnosis, registration and therapy in all regions of the country.

INTRODUCTION

Contemporary data has established that cancer is not, after all, a rare disease in the developing countries. Indeed, incidence rates far in excess of what had been found in the developed countries had been reported for certain cancers from a number of African cancer registries. Childhood cancer, a rising problem in Nigeria, has received little or no attention in the past. Akang and others had argued that childhood cancers will assume greater public health importance in Nigeria with the effective use of broad spectrum antibiotics, successful control of malaria and improved living conditions.

Given that facilities for the cure of pediatric oncology patients remain haphazard or nonexistent in the country, the vast majority of children who develop these cancers will eventually die of the disease, as compared to over 50 percent cure rates recorded by paediatric cancer hospitals in developed countries.

Nonetheless, reliable epidemiological data on paediatric cancers in Nigeria are lacking and the official statistics present a much distorted picture.

We know of no published article describing the pattern and distribution of cancer in children in Sokoto, Northwestern Nigeria. A pathology-based relative frequency study, therefore, would increase awareness on the diseases and highlight their prevalence and pattern. This is a report of the pathology laboratory descriptive pattern for cancers diagnosed in children under 15 years in UDUTH Hospital, Sokoto from 1999 – 2004.

MATERIALS AND METHODS

A total of 158 cases of paediatric cancer diagnosed by histology or cytology in the Usmanu Danfodiyo University Teaching Hospital (UDUTH) were analyzed to determine the pattern of cancer. The department of Histopathology processes specimens principally from the UDUTH, Nona Children Hospital, Specialist Hospital Sokoto, Sir Yahaya Memorial Hospital and numerous other general hospitals and private clinics.

Cancer data on children under 15 years of age were collated from the registers of the department of which keeps archives of histology and cytology reports, microscopic slides and paraffin blocks of patients' biopsies that have been stored serially on yearly basis. Demographic information was collected on each case indicating the clinical summary, nature of specimen and diagnosis.

All cases diagnosed on or after January 1999 to December 2004 were considered for analysis. The respective slides were retrieved and reviewed

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for diagnostic accuracy for cancer based on established microscopic criteria. Cases of missing slides or request cards were excluded from the study. The results were tabulated and analyzed and are presented in simple frequency tables and figures.

RESULTS

One hundred and fifty eight cases of childhood cancers were studied. This figure represents 17.3 percent of the total pathologically diagnosed malignancies in the center during the period 1999 – 2004. The cancers were found in 98 male and 60 female patients giving a male to female ratio of 1.66:1.00. This male predominance was pronounced in all the major tumour types. Table I shows the rank order and percentage frequency of the five most common tumours. Together, these five major tumours accounted for almost 90% of the reported childhood cancer cases in Sokoto. The most frequent tumour type observed was 56 cases of Burkitt’s lymphoma representing 35.5 percent of the overall total. This is followed by retinoblastoma, rhabdomyosarcoma and Wilm’s tumour with 25, 19 and 13 cases respectively. Rhabdomyosarcomas were the commonest soft tissue sarcomas majority of which arose in the head and neck. Three cases of sacrococcygeal teratoma were found which constitutes less than 2% of the total malignancies.

DISCUSSION

It is known that the prevalence of majority of cancers in African children is markedly reduced compared with the developed world. Genetics, differences in social circumstances and some largely undefined environmental influences are believed to play significant roles in this regard. Stiller et al; reported that in Britain the age-standardized annual incidence was 118.3 per million persons per year in children, which is a lot higher than 22 per million persons per year reported in Nigeria. However, such lower recorded frequencies should be interpreted with caution as reliable epidemiological data about childhood cancers in Nigeria is virtually non-existent. In addition, many childhood malignancies in the country might never be attended by a qualified physician or recorded in a tumour registry. This situation could be attributed to widespread illiteracy, unavailability of modern health care services, delayed or missed diagnoses, and absence of facilities for population based cancer registration.

TABLE I: Frequency and gender distribution of paediatric cancers in UDUTH Sokoto, Nigeria 1999-2004 (N=158)

<table>
<thead>
<tr>
<th>Histology Type</th>
<th>M</th>
<th>F</th>
<th>M:F</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burkitt’s Lymphoma</td>
<td>31(20.9%)</td>
<td>23(14.6%)</td>
<td>1.35:1.00</td>
<td>56(35.5%)</td>
</tr>
<tr>
<td>Retinoblastoma</td>
<td>10(6.3%)</td>
<td>9(5.7%)</td>
<td>1.11:1.00</td>
<td>25(15.8%)</td>
</tr>
<tr>
<td>Rhabdomyosarcoma</td>
<td>11(6.9%)</td>
<td>2(1.3%)</td>
<td>5.5:1.00</td>
<td>13(8.2%)</td>
</tr>
<tr>
<td>Wilm’s Tumour</td>
<td>6(3.8%)</td>
<td>2(1.3%)</td>
<td>3.0:1.00</td>
<td>7(4.4%)</td>
</tr>
<tr>
<td>NH-NBL</td>
<td>4(2.5%)</td>
<td>1(0.6%)</td>
<td>6.7:1.00</td>
<td>5(3.2%)</td>
</tr>
<tr>
<td>Others</td>
<td>24(15.2%)</td>
<td>14(9.0%)</td>
<td>1.71:1.00</td>
<td>38(24.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>98(62.0%)</td>
<td>60(38.0%)</td>
<td>1.66:1.00</td>
<td>158(100%)</td>
</tr>
</tbody>
</table>

*NH-NBL: Non-Hodgkin Non-Burkitt’s Lymphoma.

Figure 1: Age distribution of the five commonest childhood tumours, Sokoto.

Brain tumours (6 cases) and bone tumours (3 cases) were rare in this series. The histological types of the brain tumours were 3 astrocytomas, 2 medulloblastomas and an oligodendroglioma. The peak age of incidence of the paediatric tumours studied is found in the 5-9 years age group. Figure I summarizes the age distribution for the top five childhood cancers in Sokoto. It shows that whereas the peak incidence for Burkitt’s lymphoma occurs in the 5-9 years age group, the peak age for retinoblastoma, Wilm’s tumour and rhabdomyosarcoma were all found in the first five years of life. The other tumours made up 24.1 percent of the total number of cases. They include neuroblastoma, hepatoblastoma, hepatocellular carcinoma, Ewing’s sarcoma, osteosarcoma, chondrosarcoma, Kaposi’s sarcoma, gonadal carcinomas, renal cell carcinoma, Hodgkin’s lymphoma, squamous cell carcinoma, undifferentiated sarcomas, etc.
Paediatric cancers accounted for 17.3 percent of the overall malignancies diagnosed in Sokoto, a rate that is slightly higher than that reported by Williams (12.5%) in his seminar work on childhood cancers in Ibadan. The total numbers (158) diagnosed in a five-year study period is a rather low figure, but low patient accrual in hospital-based studies in the developing world is not unusual. Similar low levels of diagnostic confirmation for cancer by histology and cytology ranging between 22-28% were reported in previous cancer incidence studies in Africa. The rates for all types combined showed a clear pattern across all age groups of a higher incidence among males and predominance of lymphoma, retinoblastoma and nephroblastoma as had been established by earlier studies in other regions of the country.2,3,4,11,12

Burkitt's lymphoma maintained its pre-eminent role as the commonest childhood tumour. The relative high incidence of Burkitt's lymphoma in Africans had been of consider:able interest and is believed to be related to the endemicity of malaria and further supports a previous report from this area of Nigeria. In this study, Burkitt's lymphoma accounted for 86.2% of all childhood malignancies. Retinoblastoma was the second most frequently diagnosed cancer in the present series. It is not uncommon to find such high cases among children living in the poorest areas of the world; though it is unclear if such excesses are due to sporadic congenital cases. Furthermore, concerning this intriguing international variation in the incidence of retinoblastoma some researchers have suggested that since it is the unilateral form of the disease which is implicated, as opposed to the bilateral or genetically-determined form, environmental influences may be strongly implicated.

The study showed that retinoblastoma, Wilm's tumour and rhabdomyosarcoma were cancers predominantly diagnosed among children in the 0-4 year age group with rates rising sharply in the 5-9 year age group. Groves, et al, observed age related patterns for these cancers similar to those found in the present series. They concluded that the predominance of cases of these cancers occurring in the first year of life is consistent with prenatal influence including inherited genetic susceptibility.

Whereas CNS tumours and leukemia predominate in children in industrialized countries, in Nigeria, Burkitt's lymphoma and retinoblastoma constitute the commonest tumors in this age group. These fact will need to be confirmed by a longer period of observation. Nonetheless, the pattern shows that there is a need to ascertain which carcinogenic factors contribute to childhood cancers in Nigeria. The need to fund the establishment of childhood cancer registries and paediatric oncology centers to monitor and treat paediatric cancer in Nigeria cannot be over emphasized.

REFERENCES


