AUDIT REPORT
PREVALENCE AND OUTCOME OF MALIGNANT INFANT TUMORS SEEN AT THE LAGOS UNIVERSITY TEACHING HOSPITAL, LAGOS.

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Abstract

There is an upsurge in pediatric oncology cases seen worldwide with a commensurate improvement in survival. Infant tumors are a subset of this group and are more challenging to treat. There is a dearth of data in Nigeria largely due to the absence of a dedicated pediatric population-based cancer registry. The aim of this review was to document the prevalence as well as outcome of malignant infant tumors seen at the Lagos University Teaching Hospital over a thirty-month period. This was a retrospective audit from January 2015 till June 2017 at the pediatric oncology ward of the Lagos University Teaching Hospital. Data was entered into Microsoft Excel spreadsheet and exported into SPSS Version 20 for analysis. There were 15 infants among the 178 children seen in the study period corresponding to 8.4% with a slight male preponderance, 1.1:1. The commonest tumor seen was retinoblastoma that accounted for 53.3% of the study population. Majority of the infants had unilateral disease. All the infants who had bilateral disease died. All the patients with rhabdomyosarcoma defaulted after some courses of chemotherapy and no patient with neuroblastoma survived.

Mortality rates and treatment abandonment were very high among infants with malignancies. The lack of a robust national health insurance policy is a major contributing factor.

KEYWORDS: Infant, tumors, retinoblastoma, nephroblastoma, rhabdomyosarcoma

INTRODUCTION

Pediatric oncology cases are increasing worldwide with an estimated 250,000 cases annually.[1] An estimated 80% of these new diagnoses occur in Low to Middle income countries (LMIC).[1] Despite the increasing number of pediatric oncology cases in LMIC, survival rates hover around 25% when compared with the over 80% in the resource endowed nations.[1] There is only one population based pediatric cancer registry in Africa.[2] Thus, most of the data generated for pediatric oncology are hospital based data.

The clinical presentation, histologic manifestations, anatomical sites and clinical course of cancers differ significantly between infants and older children.[3,4] The etiology of infant cancers may be linked to aberrant prenatal or early post-natal genetic insults.[5]

Infants comprise 2.14% of the overall population of the country[6] and though the rates of cancers in this age group have been reported to be low[7], the figures for Nigeria are not known due to the paucity of data as well as the absence of a population-based childhood cancer registry.

This review though hospital based focused on the prevalence of malignant infant tumors and their outcome at a tertiary hospital in Lagos, Nigeria.

Materials and Methods

This was a retrospective, descriptive study from January 2015 to June 2017. The study location was the Pediatric Hematology/Oncology ward of the Lagos University Teaching Hospital, Idi-Araba, Lagos, Nigeria. This is one of the major teaching hospitals in Nigeria and one of the two teaching hospitals providing pediatric oncology services to Lagos state and environs. The clinical notes of the patients were reviewed for demographic data as well as clinical information and the information obtained was inputted into a proforma. The diagnoses of the tumors which were confirmed histologically were obtained from the notes. The treatment protocol was documented for all confirmed patients. The outcome was classified as survived, on treatment, abandoned treatment and deceased. Those patients who abandoned treatment received phone calls from the unit at the time of therapy as per unit protocol. The outcome of the calls was documented in the notes. Less than 25% of those called responded to the calls and all the children had died. Those whose phone numbers could not be reached were classified as abandoned treatment. Patients who were on admission at the time of compilation were described as on admission. All information was entered into a Microsoft Excel spreadsheet and exported into SPSS 20 for analysis.

Results

A total of 178 children were seen at the oncology ward in the period under review. The number of infants seen over the period were 15, representing 8.4% with a male to female ratio of 1.1:1. The mean age was 5.87 months with age range between 1 month to 12 months. Twelve months was the most common age at presentation.

The most commonly occurring infant malignancy diagnosed in the hospital in the period under review was Retinoblastoma which accounted for 53.3% of the malignancies diagnosed with 25% of these tumors been bilateral in origin. 13.3% of the tumors were neuroblastoma and rhabdomyosarcoma respectively. Variations in distribution of presentation were noted over the months; there was no identified pattern (peaks or troughs) noted over the months while data could not be collected for two months due to an industrial action. Only two patients had health insurance.

Type of infant tumor	Frequency n=15(%)
Retinoblastoma	8 (53.3)
Neuroblastoma	2 (13.3)
Rhabdomyosarcoma	2 (13.3)
Leukemia	1 (6.7)
Wilm's tumor	1 (6.7)
Osteosarcoma	1 (6.7)
Total	15 (100)

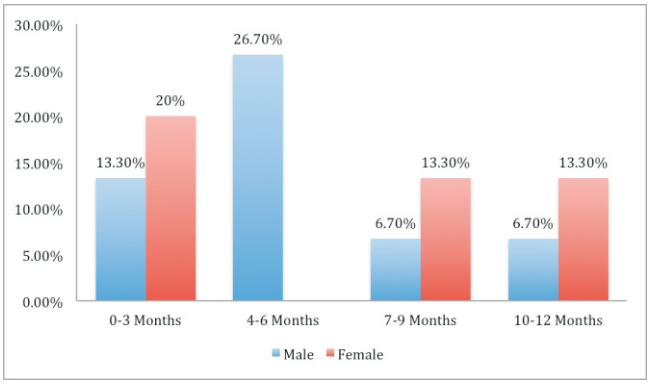

Fig 1: Age & Sex pattern of infants

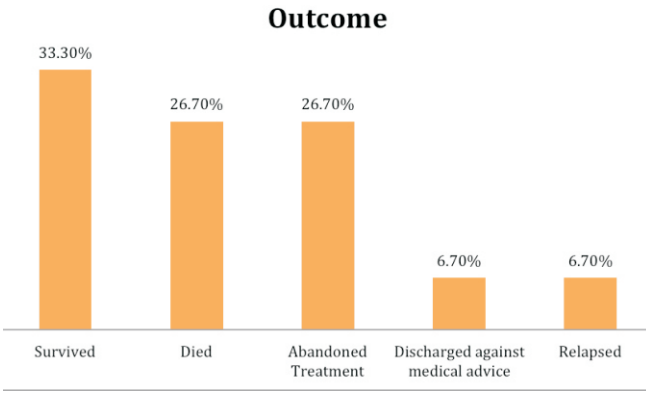

Fig 2: Outcome of infant tumors

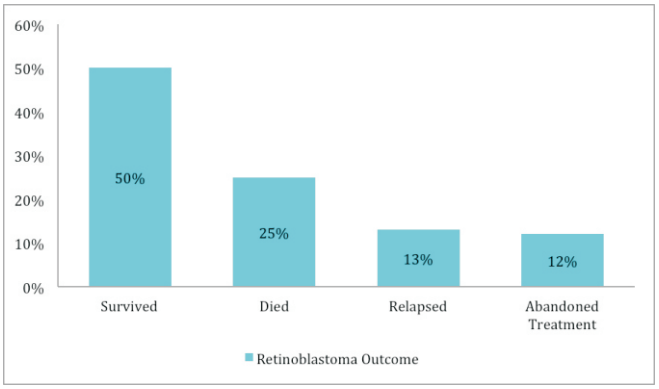

Fig 3: Pattern of outcome of infants with Retinoblastoma

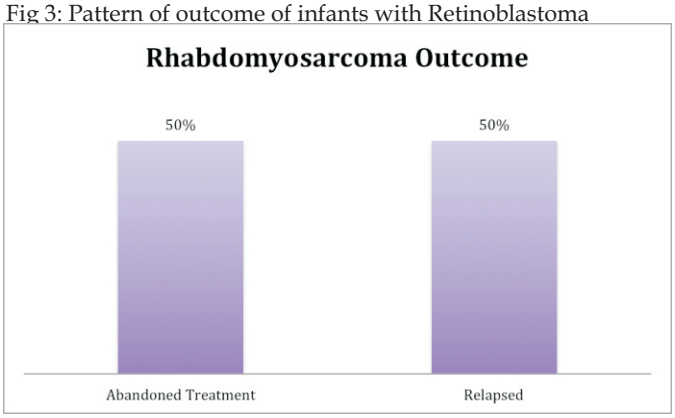

Fig 4: Outcome of infants with Rhabdomyosarcoma

There was 100% mortality associated with neuroblastoma in the series.

Discussion

It is generally accepted that most tumors that manifest in infancy are as a result of genetic alterations which are commonly prenatal or perinatal.[5] In this review, most of the patients were older than six months at presentation. (see Table 1) This is comparable to a report from the United States where the median age for a review of infants with Rhabdomyosarcoma was 7.4 months.[8] This early presentation supports the assertion that malignant tumors in infancy are mainly due to genetic alterations[9]. The most common malignant infant tumor in this review was retinoblastoma which has been reported to occur commonly as a result of either genomic or somatic mutations.[10] (see Table 1) This is unlike what has been reported from some other registries among infants.[3,7] In a report of the pediatric cancer registry in South Africa, retinoblastomas were not as common as leukemias or nephroblastomas.[11] The disparity in our report may be due to the fact that this is a hospital based report from one institution and is thus limited. Among the children with retinoblastoma in this review, most had unilateral unifocal disease which is usually attributed to somatic mutation with better outcome.[12] Approximately half of the patients with unilateral retinoblastoma were alive two years post treatment. (see Figure 3) The recorded mortality was among those with bilateral disease who also had intracranial extension and intracranial extension has been described as an important predictor of mortality among those with retinoblastoma.[13] The patients with bilateral disease presented earlier than reports from most parts of the developing world. [14,15] However, despite the seemingly early presentation, the patients succumbed to the disease. This may not be unconnected with lack of better modalities of treatment that are unavailable at present, including access to health insurance, prevailing poverty as well as cultural and religious beliefs which are important determinants of survival. The presence of health insurance has been reported to contribute to improved survival statistics among infants with

malignancies.[16] In this review, only 2 of the patients had some form of health insurance corresponding to 13% of the study population. Most patients in the more endowed nations present with intraocular disease[17] which is usually as a result of improved screening programs as well as a more robust healthcare system unlike what is available in resource constrained settings. Furthermore, care is usually borne by health insurance, unlike what is available in Nigeria where majority of parents pay out of pocket.[18]

Neuroblastoma accounted for less than a quarter of the patients seen in the cohort under review unlike in western nations, where it has been described as the most common intracranial tumor of infancy.[19] However, this report is similar to the report from Taiwan where extrcranial neuroblastoma was not common among the infants.[20] Unfortunately, the patients seen in this cohort all died .It has been reported that advanced disease is a poor prognostic marker and the two infants(both died) had advanced diseae.[21] The intensive chemotherapy, immunotherapy and stem cell rescue therapy which has been reported to improve survival to about 50% are not possible in Nigeria due to poor infrastructure and support services.[21,22]

Rhabdomyosarcoma is the commonest soft tissue sarcoma in children and it is not very common amongst infants.[8] However, it was the most common soft tissue sarcoma seen among infants in Lagos. (See figure 4) Both patients with rhabdomyosarcoma had embryonal histologic tumors located in the head and neck. However, no cytogenetics were performed for the patients. Unfortunately, both patients absconded from treatment after receiving two and three courses of treatment respectively. This drop-out may not be unconnected with the rapid resolution of the swellings coupled with the improved health of the infants. Thus, the parents commonly assume the children are better and do not need more courses of chemotherapy. It is evident that ignorance and poverty are still prevailing problems in Sub-Saharan Africa.[23,24]

There were fewer cases of nephroblastoma and osteosarcoma in this review when compared with American and Asian registries that reported more cases of these malignancies.[3,7]This low figures may be due to the fact that this is a hospital-based review unlike data from registries. (See Table 1)

Unlike what was reported in most other cohorts, there was no case of brain tumor among the patients seen over the thirty-month period.[3,7] The other reports were from population-based cancer registries while this is a case-based report from the hospital. It is not unlikely that the patients may have presented to other healthcare facilities in Lagos.

Conclusion

In conclusion, infant tumors are not uncommon in Lagos with retinoblastoma as the commonest infant tumor. There is still a high prevalence of treatment abandonment as well as mortality. A lot of work still needs to be done to improve health insurance coverage including provision of paediatric oncology services which may improve outcomes.

Conflict of Interest: The authors declare no conflict of interest

Financial Disclosure: The authors have none to declare

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