Original Article

Pattern of Brain Tumours Among Children in Central Sudan

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ABSTRACT -

Background The pattern of childhood brain tumours during the past ten years in Gezira area-central Sudan was reviewed.

Procedure: The study was a retrospective analytical study included all patients who were 15 years or younger at the time of first presentation to National Cancer Institute-University of Gezira-Sudan (NCI) and who were diagnosed with one of the brain tumours. The study covered a period of 10 years –from 1999 to 2008.

Results: During the study period there were 17 patients (3.7% of all childhood malignancies) presented with one of the brain tumours. Male: female ratio was approximately 0.9:1, the majority of them were between 5 and 10 years of age (47%) and most of them came from rural origins (59%). Glioma was the predominant diagnosis. Unfortunately 7 patients (41%) died during this period, 8 (47.1%) alive, and 2 (11.8%) escaped from the hospital. A surgical attempt for excision was only performed in 5 patients (29%).

Conclusion: The study reflects the overall poor referral rate of childhood brain tumours and the inadequate surgical management which led to high mortality rate reported. The study also showed that, Gezira region pattern is similar to other African region where brain tumours do not predominate.

Introduction

National Cancer Institute, University of Gezira (NCI-UG) in the central of Sudan is the only referral center for children with cancer in Gezira area and the only cancer institute in Sudan outside the capital Khartoum; it is the second one of the only two cancer centers in the country.

Reports on the patterns and incidence of childhood cancer in Sudan are rare. The objective of this study was: to determine the patterns of childhood brain tumours in Gezira State, central Sudan during a period of 10 years.

Patients and methods

The study was a retrospective analytical study included all patients who were 15 years or younger at the time of first presentation to NCI and who were diagnosed with one of the brain tumours. The study covered a period of 10 years –from 1999 to 2008. The study looked at many variables concerning the patients and their tumours. These variables included age, sex, residence, duration of symptoms prior to presentation, type of tumour, mode of diagnosis and presenting symptoms. These variables were then analyzed and discussed.

Results

During the study period there were 5296patients attended the NCI for management. 464 (8.7%) of them were children. 17 (3.7%) patients of these children presented with one of the brain tumours. Male: female ratio was approximately 0.9:1, the majority of them were between 5 and 10 years of age (47%) and most of them came from rural origins (59%). Glioma was the predominant diagnosis (Table 1)

Astrocytoma was either pilocytic astrocytoma grade 1 (3 patients) or diffuse fibrillary Astrocytoma grade 2 (one patient). Gliomas were seen more frequently in the brainstem (4 patients out of 6). Ependymoma grade 2 and DNET grade 1 were diagnosed in only one patient for each condition. The most common presenting symptoms among the study group were headache (53%), defective vision/squint (35.3%), and ataxia (29.4). Most of these patients presented within 3 months after developing symptoms (59%). The disease was confirmed by histopathology examination and scans in 7 patients (41%) and by scans only in 10 patients (59%). Unfortunately 7 patients (41%) died during this period, 8 (47.1%) alive, and 2 (11.8%) escaped from the hospital. A surgical attempt for excision was only performed in 5 patients (29%).

Discussion

The incidence of childhood cancer varies greatly throughout the world depending on its type. Though lower compared with the incidence of some adult cancers, cancer comes next to accidents as the leading cause of death among children in the developed world. (1) The pattern of childhood cancer in America and Europe is almost the same with leukemia and central nervous system tumors account for over one-half of the new cases. Data on childhood cancer incidence and patterns in Africa are sparse. Although there are many papers published reporting incidence and patterns in some African countries (1, 2, 3, 4, 5, 6, 7, 8).

Patients with primary brain tumors have the highest morbidity among all childhood malignancies. However the outcome has improved over time owing to innovation in neurosurgery, radiation therapy and chemotherapy (9). Approximately 2200 primary brain tumors are diagnosed each year in children with overall annual incidence of 28 cases per million in United States of America.There is high incidence of CNS tumors in infant and young children up to 7 years of age (36 cases /million) compared to older children and adolescence (10) although the current study population showed a different age distribution which might reflect the effect of the small number of patients.

Brain tumors in childhood differ considerably from adult form in term of distribution within the brain, histologic characteristics and prognosis. They can present in different ways depending on the location, types, rate of growth and age of the child (11).

Previous studies about the pattern of childhood cancer in the Gezira region showed brain tumours to represent 1.1% (12) or 1.7% (13). In the current study we report a higher rate (3.7%) which could be due to the fact that this study covered a longer period of time. This rate although higher than the previous ones but it indicates that the pattern in Gezira is similar to other African countries where CNS tumour does not represent the commonest malignancy among children and contradict the pattern in Europe and America where leukemia and CNS tumours predominate. This rate could also reflect the low accrual of patients to the institute and might not indicate a real distribution pattern.

In the current study Glioma is the most common brain tumour and most of

Table 1. Distribution of CNS tumours among the study group

Type of tumour	Type of tumour	Percentage
Astrocytoma	4	23.5
Glioma	6	35.2
Medulloblastoma	4	23.5
Ependymoma	1	5.9
DNET	1	5.9
Craniopharygioma	1	5.9
Total	17	100

the patients presented with brainstem glioma where treatment outcome and prognosis rates are still decimal. Astrocytoma and medulloblastoam has equal distribution among the study population (23.5%) but unfortunately in the absence of a neurosurgeon in the region most of the patients had to travel to the capital to get neurosurgery services where the waiting list is long and the treatment is costly and as a result many patients fail to have adequate management.

Ependymoma, craniopharyngioma and DNET are even rarer among the study group.

The total number of patients reported in this study reflects the poor referral of such cases to the NCI. This might be explained by many factors, the most important one is the poor socioeconomic status of the families, but the impact of traditional treatment could not be denied as all cases associated with CNS symptoms managed first by religious leaders in the community (Sheikhs).

Another important aspect in the management of these tumours which could explain the high mortality rate among the study group is the absence of the neurosurgery facilities in the region and the limited diagnostic facilities where there is only one MRI unit.

Conclusion

The study reflects the overall poor referral rate of childhood brain tumours and the inadequate surgical management which led to high mortality rate. The study also showed that, Gezira region pattern is similar to other African region where brain tumours do not predominate.

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