Analysis of Epidemiology of Brain Tumour amongst Pediatric Population: A Retrospective Study

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Abstract

Background and Objectives: *The reported incidence of Brain Tumoursis low in Asian and African continents. The various risk factors for these brain tumours are restricted to genetic syndromes and ionizing radiation of head and neck. There have been ingenious studies reporting that the peak incidence of brain tumour is at the age of 10 years and it reduces on both sides of this age. The present study was aimed at evaluating and assessing the epidemiology of brain tumours amongst children of Kyrgyzstan.*

Materials and Methods:*The present study is a retrospective study conducted in the National Centre of Oncology, Bishkek (Kyrgyzstan) during a period of 1 year. The data for the study were obtained from the various oncological institutes of the Republic. The hospital records of subjects with the malignant tumours of the central nervous system were analysed. All the data, thus, obtained was arranged in a tabulated forma and analysed using SPSS software.*

Results:*For the period of research, the records of 1272 patients whose age ranged from 3 months to 20 years were studied. The mean age of patients was 12.32 ±2.87 years. The annual rate of females was 3.45± 0.5, and annual rates for both genders were 3.78+0.34. The maximum frequency was seen in the Angiosarcoma (n=126).*

Conclusion:*From the aforementioned study, it can be concluded that annual morbidity rate is more amongst male subjects compared to females.*

Keywords: *Genetic, Pediatric, Tumour.*

Introduction

Cranial tumours in paediatric age group have high occurrence rate in countries like Hawai islands, Canada, Brazil and Finland. The reported incidence of these tumours is low in Asian and African continents, except for Israel, as in Jewish population, there is a high incidence of brain tumours amongst children [1,2]. The most common paediatric solid tumours are childhood brain tumours and they have various histological types. With various advancements, there have been improvements in the survival rates of some subtypes of tumours. The various risk factors for these brain tumours are restricted to genetic syndromes and ionizing radiation of head and neck. There have been studies reporting that peak incidence of brain tumour is at the age of 10 years and it reduces on both sides of this age. This pattern of curve is similar in cases ofastrocytomas and brain tumours [3,4]. Tumours such as oligodendrogiomas start increasing after the age of 10 years and increases till the age of 20 years. Tumours such as ependydoma the incidence is maximum at 10 years and then decreases after that till the age of 20 years [5]. The incidence of embryonic tumours decreases after the age of 5 years [6]. The present study was aimed at evaluating and assessing the epidemiology of brain tumours amongst children of Kyrgyzstan.

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Materials And Methods

The present study is a retrospective study conducted in the National Centre of Oncology, Bishkek (Kyrgyzstan) during a period of 1 year. The study was approved by the Institutional Ethical Committee. The study was conducted to assess the frequency of occurrence of brain tumours

amongst pediatric subjects. The data for the study were obtained from the various oncological institutes of the Republic. The hospital records of subjects with the malignant tumours of the central nervous system were analysed. The rate of tumour morbidity was also calculated amongst both the sexes and analysed. The frequency of Central Nervous System tumours was also calculated. All the data, thus, obtained was arranged in a tabulated forma and analysed using SPSS software. The test of significance applied was student t test and chi square test. The probability value of less than 0.05 was considered significant.

Results

For the period of research we studied records of 1272 patients whose age ranged from 3 months to 20 years. The mean age of patients was 12.32 ±2.87 years (Table 1).

Table 1: Demographic details of the subjects

Demographic		Frequency
Gender	Male	672
	Female	560
Mean Age		12.32 years

Table 2: The annual rate of central nervous system tumour morbidity

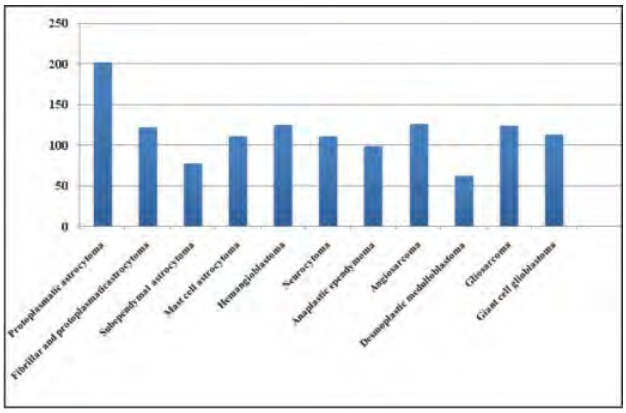
Gender	Annual rate	P value
Male	4.07±0.24	<0.05
Female	3.45±0.5	

Table 2 shows the average annual rates of CNS malignant tumour morbidity in Kyrgyzstan. We observed that Male gender have higher annual rate of CNS malignant tumour morbidity, i.e., 4.07±0.24. The annual rate of females was 3.45± 0.5, and annual rates for both genders were 3.78+0.34. Table 3 shows the frequencyof patients in various types of CNS malignant tumour. It was observed that frequency of patients in Protoplasmatic astrocytoma was 202, in Fibrillar and protoplasmatic astrocytoma was122, in Subependymal astrocytoma was 77, Mast cell astrocytoma was 111, Hemangioblastoma was 105, Neurocytoma was 81, Anaplastic ependymoma was 79, Angiosarcoma was 106, Desmoplastic medulloblastoma was 125, Gliosarcoma was 124, and in Giant cell glioblastoma was 113. Thus, maximum frequency was seen in the Angiosarcoma (n=126).

Table 3: Incidence of various different types of tumours

Type of tumour	Total number
Protoplasmatic astrocytoma	202
Fibrillar and protoplasmaticastrocytoma	122
Subependymal astrocytoma	77
Mast cell astrocytoma	111
Hemangioblastoma	125
Neurocytoma	111
Anaplastic ependymoma	99
Angiosarcoma	126
Desmoplastic medulloblastoma	62
Gliosarcoma	124
Giant cell glioblastoma	113
Total	1272

Graph 1: Incidence of various different types of tumours



Discussion

Brain tumours are most commonly seen solid tumours amongst children. They are of various histological types. In a study conducted by Johnson KJ et al. to investigate the epidemiology of brain tumours amongst children and reduced the after effects of concentrated distributed since 2004 that included the rate, survival rates and analysed the hereditary, formative and quality of birth and natural hazardous factors.[7]As per the present study, the mean age of patients was 12.32 ±2.87 years. The average annual rates of CNS malignant tumour morbidity in Kyrgyzstan showed, males have a higher annual rate of CNS malignant tumour morbidity, i.e., 4.07±0.24. The annual rate of females was 3.45± 0.5and annual rates for both genders was 3.78+0.34. We observed that frequency

of patients in Protoplasmatic astrocytoma was 202, in Fibrillar and protoplasmatic astrocytoma was122, in Subependymal astrocytoma was 77, Mast cell astrocytoma was 111, Hemangioblastoma was 105, Neurocytoma was 81, Anaplastic ependymoma was 79, Angiosarcoma was 106, Desmoplastic medulloblastoma was 125, Gliosarcoma was 124, and in Giant cell glioblastoma was 113. Thus, maximum frequency was seen in the Angiosarcoma (n=126). In a study conducted by Zardze DG et al, the danger of leukemia was relatively higher amongst those living less than 200 km from the air testing sites compared to those living at 400 km or more. There was a relative difference of 1.76.[8]In a study conducted by Igissinov N et al. that over a period of time, instances of MT CNS were 4604. The unrefined yearly occurrence rate was 3.7±0.10/0000.[9]In another study, which assessed the one year survival rate of subjects with life threatening CNS tumours was 56.5%, and 79.5% and 33.1% for Grades I-II and Grades III-IV, separately.[10]With tremendous advancements in the field of neuro imaging, the diagnosis of cranial tumours has become easier with better idea about tumour recurrence and dissemination.[11] There has been marked improvement in the survival rate of such subjects. There has been an improvement ranging from 60% to 70% after the chemotherapy during or along ith radiotherapy. There have been various researches on the use of chemotherapy primarily during and after radiotherapy.[12,13]

Conclusion

From the above study, it can be concluded that annual morbidity rate is more amongst male subjects compared to females. Since there is an increased occurrence of these tumours, more researches need to be conducted in this field to improve the management strategies and the prognosis.

Conflict Of Interest: None

Refrences

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