



A STUDY ON RELATIVE INCIDENCE OF DIFFERENT INTRACRANIAL TUMOURS ON THE BASIS OF HISTOPATHOLOGY, PMCH, PATNA

Pathology

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ABSTRACT

In this retrospective as well as prospective study 26 cases of intracranial tumors were included and each case was studied with brief clinical history like age of the patient, sex and origin of the intracranial tumors and histopathological examination of each case was done by routine paraffin wax sections and stained by H&E stains. In the present study, males predominated females in all age groups and male to female ratio was 2.71. 35% of patients with intracranial tumors were in the age group of 41-60 years, 31% of patients were in the age group of 21-40 years, 27% were in the age group of 0-20 years and only 8% cases were noticed in the age of 61 years or above. In the present study, most common intracranial tumours were neuroepithelial tumors (73%), followed by meningioma (15%), neuroblastoma (8%), ependymoma (5%), with not a single case of secondary tumor, plasma cell neoplasm, leukaemia and lymphoma of central nervous system. Since, the intracranial tumors are rare, the finding of present study may be considered as almost a broad representation of the different types of intracranial tumors commonly encountered.

KEYWORDS:

Intracranial Tumours, Incidence, Histopathology, Age, Sex.

I. INTRODUCTION

Intracranial tumors amount to less than 2% of all malignant neoplasms and thus constitute a small fraction of overall human cancer burden. Tumors of the nervous system are the second most common form of cancer in children after leukemias. Intracranial tumors in children accounts 20% of all paediatric neoplasms (Kaye A.H. et al, 1995). Of all intracranial tumors approximately 60% are neuroepithelial origin, 28% are meningeal and 7.5% derive from cranial and spinal nerves. Lymphoma and germ cell tumor. Primary intracranial tumors may arise from cells of the brain parenchyma and from its intracranial linings. Secondary intracranial tumor may arise in the skull or neighbouring structures and extend through the skull or cranial foramina, or they may arise at distant sites and spread haematogenously to the brain or duras each account for 4 and 1%, respectively. Intracranial tumors usually present with one of three syndromes.

1. Subacute progression of a focal neurologic deficits
2. Seizures; or
3. Nonfocal neurologic disorder such as headache, dementia, personality changes, or gait disorder.

II. MATERIAL & METHOD

In this study, specimens of Intracranial tumors received in Department of Pathology, Patna Medical College, Patna, from December 2008 to September 2010 were included. Histopathological examination of specimens was done by routine paraffin wax sections and stained by H&E stains through step wise procedures of fixation, dehydration, clearing of tissues, impregnation with molten paraffin wax, block cutting, section cutting, staining, dewaxing, hydration, staining, dehydration, clearing & mounting.

III. RESULTS

In this study, the results were based on the histopathological studies of 26 cases of intracranial tumors received in the Department of Pathology, Patna Medical College, Patna, December 2008 to September 2010. Results were recorded on the basis of incidence of intracranial tumors in different age groups, sex-wise and origin-wise. The relative incidence of different types of intracranial tumors were studied on the basis of histopathology. Among the primary tumors of brain, highest incidence were found to be those of neuroepithelial origin (73%) and rest 27% of the cases were meningeal (15% cases), neuroblastoma (8% cases) and ependymoma (4% cases) respectively (Table I)

Table – 1

Table showing the relative frequency of different types of intracranial tumors

Name of different types of intracranial tumors	No. of cases	Percentage of cases
(A) Primary	26	100
(1) Neuroepithelial tumor	19	73
(2) Neuroblastoma	02	08
(3) Meningioma	04	15
(4) Ependymoma	01	04
(B) Secondary	0	0

Neuroepithelial tumors of astrocytic origin constituted 95% of all gliomas and 69% of intracranial tumors. Whereas oligodendroglioma constituted 5% of all gliomas and 4% of all intracranial tumors. (Table-2)

Table – II

Table showing the incidence of different neuroepithelial tumors.

Sl. No.	Name of different neuroepithelial tumors	No. of cases	Percentage
1.	Astrocytic tumor	18	95
2.	Oligodendrogial tumor	1	5

Among all astrocytic tumors, astrocytoma grade – II was the most common constituting 44% of the cases followed by astrocytoma grade – I in 28% cases, anaplastic astrocytoma in 17% and glioblastoma multiforme in only 11% cases. (Table-3)

Table III

Table showing the incidence of astrocytic tumors.

Sl. No.	Name of different astrocytic tumors	No. of cases	Percentage
1.	Astrocytoma grade – I	5	28
2.	Astrocytoma grade – II	8	44
3.	Anaplastic astrocytic or astrocytic grade – III	3	17
4.	Glioblastoma multiform grade – IV	2	11

The following table shows the age-wise incidences of different types of intracranial tumors found in the present series.(table-4)

Table – IV

Table showing the age-wise incidence of different types of intracranial tumors.

Sl. No.	Different types of intracranial tumors	Age- wise incidence of intracranial tumors			
		0-20 years	21-40 years	41-60 years	60 years & above.
1.	Astrocytoma grade – I	4	1	-	
2.	Astrocytoma grade – II		5	3	
3.	Astrocytoma grade – III	-	-	2	1
4.	Glioblastoma multiforme	-		2	-
5.	Oligodendroglioma			1	-
6.	Meningioma	-	2	1	1
7.	Ependymoma	1	-	-	
8.	Neuroblastoma	2		-	

Among all intracranial tumors in sex-wise distribution, it is more common in male with a male to female ratio of 2.11. (Table-5)

Table – V

Table showing the sex-wise distribution of different types of intracranial tumors.

Sl. No.	Different types of intracranial	Sex-wise distribution	
		Male	Female
1.	Astrocytoma grade – I	4	1
2.	Astrocytoma grade – II	6	2
3.	Astrocytoma grade – III	2	1
4.	Glioblastoma multiforme	2	0
5.	Oligodendroglioma	1	0
6.	Neuroblastoma	2	0
7.	Meningioma	1	3
8.	Ependymoma	1	0
	Total	19	7

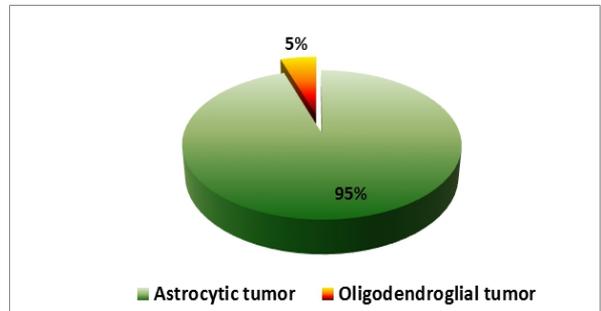
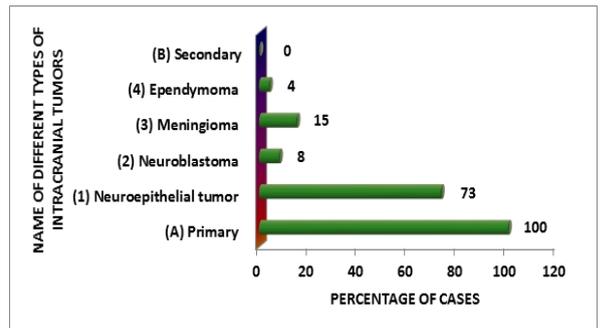
In total 26 cases of brain tumors, 19 cases were found in males and 7 cases were found in females. The above table shows that the astrocytic tumors and other tumors of brain were more common in males with exception of meningeal tumors which were more common in females. In the present study, meningioma were more common in females with male to female ration 1: 3 (Table-6).

Table – VI

Table showing the relative frequency of meningioma in both sexes.

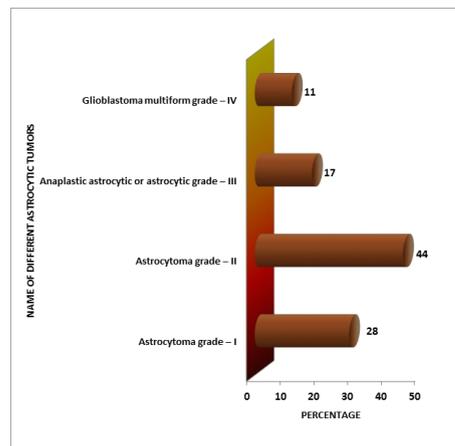
Meningioma	Distribution of meningioma in both sex groups	
	Male	Female
Meningioma	1	3

HISTOGRAM SHOWING THE RELATIVE FREQUENCY OF DIFFERENT TYPES OF INTRACRANIAL TUMOURS

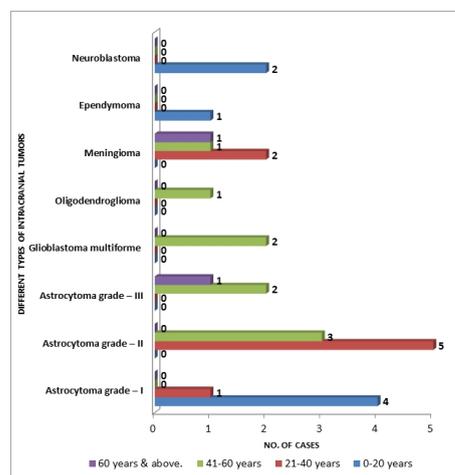


PIE CHART SHOWING THE INCIDENCE OF DIFFERENT NEUROEPITHELIAL TUMORS

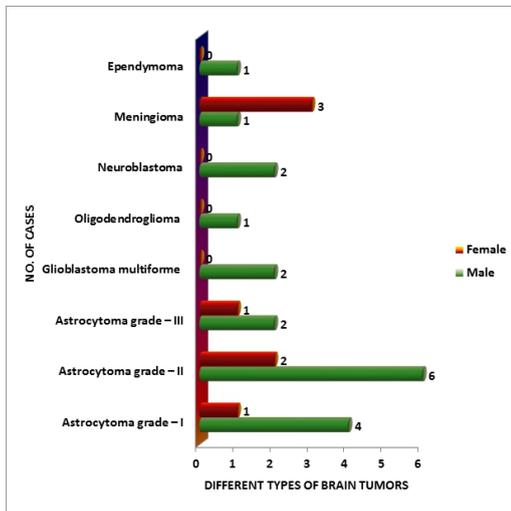
HISTOGRAM SHOWING THE INCIDENCE OF ASTROCYTIC TUMORS



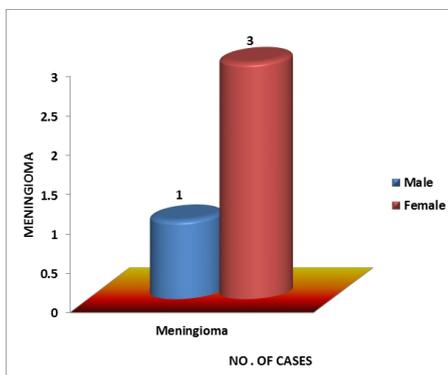
HISTOGRAM SHOWING THE AGE-WISE INCIDENCE OF DIFFERENT TYPES OF INTRACRANIAL TUMORS



HISTORGRAM SHOWING THE SEX-WISE DISTRIBUTION OF DIFFERENT TYPES OF INTRACRANIAL TUMORS



HISTORGRAM SHOWING THE RELATIVE FREQUENCY OF MENINGIOMA IN BOTH SEXES



V.DISCUSSION

Intracranial tumors are rare and uncommon tumors in Asian. Since last 40 years, not a single study has been done to find out the incidence and trends of this tumor in this region. This study was conducted to analyse the various aspects of the intracranial tumors in Bihar region. It was a prospective and retrospective study comprising of 26 cases of brain tumors, received and identified in the Department of Pathology, PMCH Patna and other adjoining hospitals of Patna in the past two years.

In this study, males predominated females in all age groups and male to female ratio was 2.71. The age of patients varied from 2½ years to 69 years. 35% of patients with intracranial tumors were in the age group of 41-60 years, 31% of patients were in the age group of 21-40 years, 27% were in the age group of 0-20 years and only 8% cases were noticed in the age of 61 years or above. In this study, intracranial tumors were more common in the age range of (41-60 years).

The study showed that astrocytoma grade-I were found in children and young adults with the age range of (0-20 years). Astrocytoma grade-II or diffuse astrocytoma were more common in the age range of (21-40 years). Anaplastic or grade-III astrocytomas were noticed more commonly in the age group of 41-60 years. Glioblastoma multiforme were noticed in the present study more commonly in age group of 41-60 years. A solitary ependyoma was found in the age of 9 years. Meningiomas, were found to be the most common in 21-40 years of age. The period were found to be in the age range of 0-20 years with the mean age of 6.5 years.

Incidence of Intracranial Tumors

The study showed overall incidence of neuroepithelial tumors as 73%, which were the more common among all brain tumors. It was noticed that among all neuroepithelial tumors, astrocytomas along with

anaplastic astrocytoma, and glioblastoma multiforme were most common glial tumors. Among the glial tumors, ependyoma constituted only 5% during the study period. Neuroblastoma were found to be 8%, this was due to among 26 cases, 7 cases were noticed in the children and young adults in short period of Study. In Bihar region, incidence of central neuroblastoma is higher than the other parts of world. Meningiomas among all intracranial tumors have constituted 15% in the study. Not a single case of secondary tumor, plasma cell neoplasm, leukaemia and lymphoma of central nervous system was found in the study period.

VI.CONCLUSION

In this study, tumors of neuroepithelial origin (73%) were found in maximum number. Metastatic tumors, CNS lymphoma and leukaemia of central nervous system were not found in this study of short duration and hence, the small number of cases in the present series. Among neuroepithelial tumors, 95% of astrocytoma and 5% of oligodendroglomas were found. Other tumors of brain comprised of meningioma 15%, neuroblastoma 8% and ependyoma 4%.

Among gliomas, astrocytoma grade-II was found most commonly in 44% cases, whereas glioblastoma multiforme was noticed in 11% of all gliomas. This reduced incidence of glioblastoma multiforme was due to the small number of cases of intracranial tumors which were found and identified histopathologically and also due to the fact that small tissue bits of intracranial tumors which were received may not have been the representative area of tumor. Many cases of glioblastoma multiforme could had died undetected and sent away without getting any confirmation by medical autopsy. In this study, astrocytoma grade-I and neuroblastomas were noticed in children and young adults, whereas meningiomas were more common in females with male/female ratio 1:3. Metastatic tumors, primary lymphomas and leukaemia were not found in the study period due to small number of cases and short duration of study period.

Since, the intracranial tumors are rare, the finding of present study may be considered as almost a broad representation of the different types of intracranial tumors commonly encountered.

VII.BIBLIOGRAPHY

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