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## Original Article

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# Incidence Of Different Lesions In Brain – 2 Years Study In A Teaching Hospital In Telangana, India

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### Abstract:

**Introduction:** The anatomic location of lesion in the brain influences the prognosis and treatment options. There is an increase in the incidence of primary lesions in brain in recent decades. The increasing incidence may be due to improved diagnostic methods such as modern radiologic imaging & better access to neurosurgical services.

**Objectives:** The aim of this article is to study the incidence of brain tumors in two consecutive years.

**Methods:** A total of 139 biopsies from brain and central nervous system were studied in patients attending NH Mallareddy Hospital, Suraram, Qutbullapur, Hyderabad, Telangana, India. The incidence of various lesions were studied lesion wise, location wise, age wise and sex wise.

**Results:** In our study the most common lesion was glioma, commonly seen in third and fourth decades and the common location being frontal lobe. Glioblastoma multiforme and other anaplastic variants were seen after 40 years and pilocytic astrocytoma was noted in children and young adults.

**Conclusion:** The incidence of different gliomas were analyzed on the basis of anatomical location and its histological type. The area with densest occurrence was the anterior subcortical region in the frontal lobe. The most frequent subtypes were glioblastoma multiforme (31.8%), astrocytomas grade I, II and III (30.3%) and oligodendroglioma (13.6%). Our results demonstrate considerable heterogeneity in the anatomic distribution of gliomas in the brain.

**Key Words:** Incidence, Glioma, Astrocytoma, Frontal Lobe.

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### INTRODUCTION:

The aim of this article is to give an overview of the burden of brain tumors in the population. There have been reports of increasing incidence of primary tumors in recent decades which need to be interpreted with caution. The increasing incidence may be due to improved diagnostic methods such as modern radiologic imaging & better access to neurosurgical services.<sup>[1,2]</sup>

### MATERIAL AND METHODS

The study was conducted over a period of two years from January 2013 to December 2014 in the Department of Pathology, Narayana Hrudayalaya Mallareddy Hospital, Hyderabad, Telangana, India. A total of 941 histopathological examinations were done in a period of 2 years. Out of these 139 biopsies were from brain and Central Nervous System. The biopsies were processed, paraffin embedded and sections were stained with Hematoxylin and Eosin.

**RESULTS:**

In our study 139 biopsies received from brain were analyzed to find the incidence of different lesions in brain. Out of these 126 were primary tumors (90.6%) and the rest 12 were miscellaneous lesions including metastases, parasitic infections and abscess (9.3%). In one case no opinion was possible. The incidence of various lesions were studied lesion wise, location wise, age wise and sex wise.

**Among primary tumors:** The commonest lesion was Glioma which occurred in 66 cases (52.38%) and this includes Astrocytomas grade I, grade II, grade III - 20 cases (30.3%), Glioblastoma multiforme 21 cases (31.8%), Oligodendroglioma 9 cases (13.6%), Pilocytic Astrocytoma 6 cases (9%), Ependymoma 6 cases (9%) and Gliosarcoma 4 cases (6%). Mixed anaplastic astrocytoma features were seen in two cases.

**Among other tumors:** In the order of frequency first comes the Meningioma present in 25 cases (18%) followed by Schwannomas 13 cases (9.3%), Central Neurocytoma 3 cases (2%), Round cell tumor 5 cases (3.6%), Colloid cyst 5 cases (3.6%), Haemangioma 5 cases (3.6%), Epidermoid cyst 3 cases (2%), Pituitary adenoma 3 cases (2%), Craniopharyngioma 2 cases (1.4%), Cellular spindle cell tumor 1 case (0.7%) and Dysembryoplastic neuroepithelial tumour 1 case (0.7%).

**Among miscellaneous:** Metastases seen in 5 cases, Secondary deposits of Adenocarcinoma present in 4 cases of which two were in frontal lobe, one in occipital lobe and one in cerebellum and one case of secondary deposits of follicular carcinoma of thyroid in frontal lobe, one case of parasitic infection in frontal lobe (Neurocysticercosis), Nonspecific abscess in 6 cases, gliosis one case, and no opinion was possible in one case.

**Location wise:** The lesions were Frontal 40 (27.9%), Parietal - 25 (17.5%), Occipital - 5 (3.49%), Temporal - 21 (14.6%), CP angle - 17 (11.8%), Cerebellum - 6 (4.1%), Brain stem - 2 (1.4%), Pituitary - 6 (4.1%), Pineal gland - 2 (1.4%), Ventricles - 17 (11.8%), corpus callosum 1, multiple lesions of metastases in one case. In some cases the lesions involved more than one location. They are temporoparietal - 3, parieto occipital 1, frontal and left ventricle 1, frontal and temporal regions 1, frontal and parietal 2, and occipital and temporal in one among 145 lesions we studied comparable with CBTRUS.<sup>[3, 4]</sup>

**Age wise:** The lesions were grouped age wise (Table - 1). The incidence of tumors is more in third and fourth decades followed by fifth and sixth decade.

**Sex wise :** The lesions are of almost equal incidence among males and females with slight female preponderance with 68 cases (49%) in males and 71 cases (51%) in females correlates with previous study.<sup>[4]</sup>

**DISCUSSION**

According to literature the primary brain tumors account for 80%, but in our study it is 90.6%. The commonest primary tumor is Glioma. Our results demonstrate considerable differences in distribution of gliomas with densest occurrence in the frontal lobe, followed by parietal and temporal lobes in our study while in previous study<sup>[5, 6]</sup> the higher frequency was in frontal and temporal lobes. In previous studies the higher frequency was observed in right hemisphere than left hemisphere but in our study we found equal preponderance.

Few large scale studies have been published on the detailed anatomic locations of gliomas. Gliomas, the most common group of primary brain tumors include astrocytomas - grade - I, II, III, glioblastoma multiforme (grade - IV), pilocytic astrocytoma, oligodendroglioma and ependymoma. In more detailed analysis, the tumors were distributed towards frontal subcortical areas. The cortical area consists of gray material whereas subcortical areas contain more glial cells. As gliomas develop from the glial cells, the difference between the cell types in separate areas may explain partly why tumors arise preferably from the subcortical sites. The non uniform anatomic distribution of gliomas may reflect the involvement of developmental, neurochemical or functional factors in the pathogenesis of gliomas.<sup>[1, 7]</sup>

The incidence of different histologic types of gliomas in this study were comparable with those in previous studies with astrocytomas accounting for more than half to three quarters of gliomas<sup>[8]</sup>. Astrocytomas are a heterogeneous group of neoplasms with numerous subtypes.

Diffuse astrocytomas of well differentiated fibrillary type typically present in the third and fourth decade of life. Beyond 40 years age astrocytomas exhibit anaplastic histologic features or are frank glioblastomas according to literature which correlates with our study. The four cases of glioblastoma also occur after 50 years of age.

Pilocytic astrocytomas occur in children and young adults and shows predilection for cerebellum and III<sup>rd</sup> ventricle in our study which correlates with literature.<sup>[9]</sup>

Next common lesion is meningioma occur in 25 cases, all above 30 years age (18%). The frequent locations are parasagittal, falx cerebri, sphenoid ridges and cerebellopontine angle. The histological patterns observed are syncytial, fibroblastic, transitional and psammomatous.

We observed five cases of metastases. They are metastatic deposits of adenocarcinoma in left occipital region, and frontal region, one case is showing multiple intracranial deposits of adenocarcinoma. One is showing secondary deposits of follicular carcinoma of thyroid.

We diagnosed five cases of hemangiomas, all are cavernous type. They are one each at left CP angle, right frontal lobe, left temporal lobe, parasellar region and sylvian fissure.

In frontal lobe a total of 39 lesions occurred out of which 30 are gliomas, astrocytomas - 15, glioblastomas - 4, gliosarcomas - 3 and oligodendrogliomas - 4. Next follows metastases in two cases, one is dysembryoplastic neuroepithelial tumor, one is cavernous hemangioma and one abscess.

### CONCLUSION:

Our present study gives an increasing incidence of primary tumors of brain in recent years which need to be interpreted with caution.

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**Table 1 : Relative frequency of different lesions in Brain in our 2 years study - Age wise**

≤10yrs	11yrs - 20yrs	21yrs - 30yrs	31yrs-40yrs	41yrs - 50yrs	51yrs - 60yrs	≥61yrs
Astrocytoma - 1	Astrocytoma - 2	Astrocytoma - 3	Astrocytoma - 8	Glioblastoma multiforme - 5	Astrocytoma - 2	Astrocytoma - 4
Pilocytic astrocytoma - 3	Pilocytic astrocytoma - 2	Pilocytic astrocytoma - 1	Glioblastoma multiforme - 1	Oligodendroglioma - 1	Glioblastoma multiforme - 5	Glioblastoma multiforme - 5
Medulloblastoma - 1	Round cell tumor - 1	Glioblastoma multiforme - 1	Round cell tumor - 2	Ependymoma - 1	Oligodendroglioma - 2	Gliosarcoma - 2
Round cell tumor - 1	Gliosarcoma - 1	Oligodendroglioma - 1	Meningioma - 9	Cellular spindle cell tumor - 1	Gliosarcoma - 2	Anaplastic oligodendroglioma - 1
Abscess - 1	Dysembroplastic neuroepithelial tumor - 1	Ependymoma - 1 Central neurocytoma - 1	Schwannoma - 3	Colloid cyst - 1	Ependymoma - 1	Central neurocytoma - 1
	Colloid cyst - 2	Central neurocytoma - 1	Pituitary adenoma - 2	Central neurocytoma - 1	Gliosis - 1	Schwannoma - 2
	Epidermoid cyst - 2	Colloid cyst - 2	Epidermoid cyst - 2	Craniopharyngioma - 2	Schwannoma - 3	Meningioma - 4
	Abscess - 2	Epidermoid cyst - 1	Cavernous hemangioma - 1	Schwannoma - 4	Meningioma - 6	
		Schwannoma - 2		Meningioma - 7	Pituitary macroadenoma - 1	
		Cavernous hemangioma - 2		Metastasis - 2	Metastasis - 3	
				Cavernous hemangioma - 2	Abscess - 1	
				Parasite-1 (neurocysticercosis)		
				Abscess - 1		

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