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Original Research Article.

Clinicopathological Study of CNS Tumors in Ajmer Region

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ABSTRACT

Objective: The aim of this study was to observe recent incidence of different CNS tumors and to study clinical and histopathological spectrum in Ajmer region.

Methods: In two year retrospective study, from January 2014 to December 2015, total 56 cases were analysed. Data regarding clinical presentation and radiological features were obtained from clinical case records. The biopsy samples were received in 10 % buffered formalin, routinely processed for histopathological examination and sections were stained by H&E stain. Special stain and IHC done whenever required.

Results: Samples from 56 cases were analysed and it was found that most common age group affected was between 31-40 years and 11-20 years. The mean age was 35.94 and age range was 3-74 years. Male to female ratio was found to be 1.15:1. Intracranial tumors (91%) were most common than intraspinal tumors (8%). Among intracranial tumors, supratentorial (92.15%) were more common than infratentorial (7.84%). Frontal lobe (25%) was most common affected site followed by frontoparietal region (19%). Headache (30%) was most common symptom followed by vertigo. Histologically Astrocytoma (41%) constituted the maximum number of cases followed by meningioma (28%). Metastatic tumors constituted 7% of cases.

Conclusion: This study concluded that intracranial CNS tumors were most common than intraspinal. Neuroepithelial tumors (astrocytoma) are the commonest CNS tumors. Middle age males are most commonly affected than females. In addition to clinical history and radiological finding, histopathology is always a confirmatory tool.

Key Words: Neuroepithelial Tumors, Astrocytoma, Meningioma.

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INTRODUCTION

Central nervous system neoplasms represent a unique, heterogeneous population of neoplasms and include both benign and malignant tumors. Central nervous system (CNS) tumors comprise 2% to 5% of all tumors. In India, tumors of the CNS constitute about 1.9% of all tumors.[1] 60% to 80% of brain tumors are primary and rest 20% to 40% are metastatic.[2] Heritable syndromes and ionizing radiations are the only two established causes of primary CNS neoplasms.[3] 80% involve the brain and 20% involve the spinal cord. The age distribution of CNS tumors is said to be bimodal, one peak in children, then second peak in 45-70 years of age.[4] Tumors of the CNS account for as many as 20% of all cancers of childhood and next to leukemia as a cause of death. In childhood, 70% of primary brain tumors are infratentorial and involve cerebellum, midbrain, Pons and medulla.[5] Male predilection has been described in most cases,[6] the only exception being meningioma.[7]

AIM OF THE STUDY

To observe recent incidence of different CNS tumors and their clinical and histopathological spectrum in Ajmer region.

MATERIALS AND METHODS

This retrospective study was done at the Department of Pathology in JLN medical college & attached hospital, Ajmer from January 2014 to December 2015.

Total 56 cases were analysed. Data on clinical presentation and radiological features of all cases were collected from the patients' records.

For this study, the histopathological reports maintained in the histopathology section of the department were reviewed and hematoxylin and eosin stained slides of every cases re-examined. Histological characterization of the tumors was done as per WHO classification. Special stain and IHC done whenever required.

Table 1: Gender wise distribution of different CNS tumors

Histology	Male	Female	Total	Percentage
Astrocytoma	16	8	24	42.85
Oligodendroglioma	2	1	3	5.35
Medulloblastoma	3	1	4	7.14
Mixed tumors	3	-	3	5.35
Ependymoma	1	-	1	1.78
Meningioma	1	14	15	26.78
Craniopharyngioma	1	-	1	1.78
Schwannoma	-	1	1	1.78
Metastasis	3	1	4	7.14
Total	**30**	**26**	**56**	**100**

Table 2: Age wise distribution of CNS tumors

Histology	<10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	>70 yrs	Total
Astrocytoma	2	2	7	9	-	4	-	-	24
Oligodendroglioma	-	-	2	1	-	-	-	-	3
Medulloblastoma	2	1	-	1	-	-	-	-	4
Mixed tumors	-	1	-	1	-	1	-	-	3
Ependymoma	-	-	-	-	-	1	-	-	1
Meningioma	-	1	1	5	3	1	3	1	15
Craniopharyngioma	-	1	-	-	-	-	-	-	1
Schwannoma	-	1	-	-	-	-	-	-	1
Metastasis	-	-	-	-	2	1	1	-	4
Total	4	7	10	17	5	8	4	1	56

Table 3: Shows site wise distribution of CNS tumors

location	No. of cases	Percentage
Fronto-temporal	3	5.35
Fronto-perietal	11	19.64
Temporal	5	8.92
Cerebellum	2	3.57
Frontal	14	25
Supraorbital	1	1.78
Supraseller	1	1.78
Temporo-perietal	5	8.92
Parieto-occipital	2	3.57
Frontp-parieto-temporal	3	5.35
Posterior fossa	2	3.57
Perietal	2	3.57
Spinal cord	5	8.92
Total	56	

Table 4: Shows clinical presentation of CNS tumors

Histology	Headache, Vertigo	Convulsion	Headache, Vomiting	Incoordination	Headache, Giddiness	Swelling	Diminised Vision	Headache	Headache, Convulsion	Seizure	Hydrocephalous	Paraplegia	Total
Astrocytoma	2	4	4	1	5			6	1	1			24
Oligodendroglioma		1						2					3
Medulloblastoma				1							3		4
Mixed tumors			1					1		1			3
Ependymoma												1	1
Meningioma			2		2	1		7		1		2	15
Craniopharyngioma							1						1
Schwannoma						1							1
Metastasis			1			1		1				1	4
Total	2	5	8	2	7	3	1	17	1	3	3	4	56

Table 5: Shows Histopathological type of CNS neoplasm

Histopathological diagnosis	No. of cases	Percentage
Astrocytoma	23	41.07
Oligodendroglioma	3	5.35
Medulloblastoma	4	7.14
Mixed tumors	3	5.35
Ependymoma	1	1.78
Meningioma	16	28.57
Craniopharyngioma	1	1.78
Schwannoma	1	1.78
metastasis	4	7.14
Total	56	

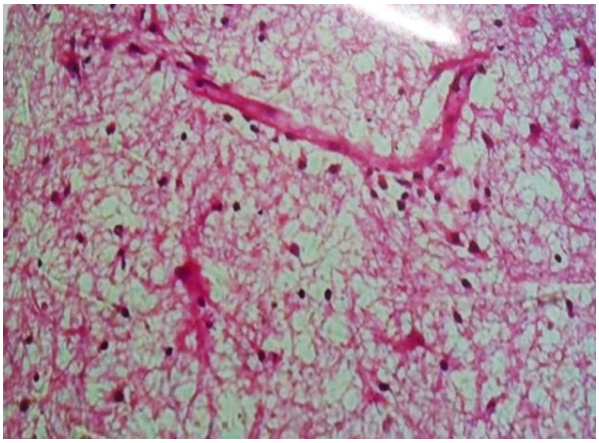

Fig 1: Pilocytic astrocytoma-Rosenthal fibers lie among the delicate and hair like cells(H&E, 400X)

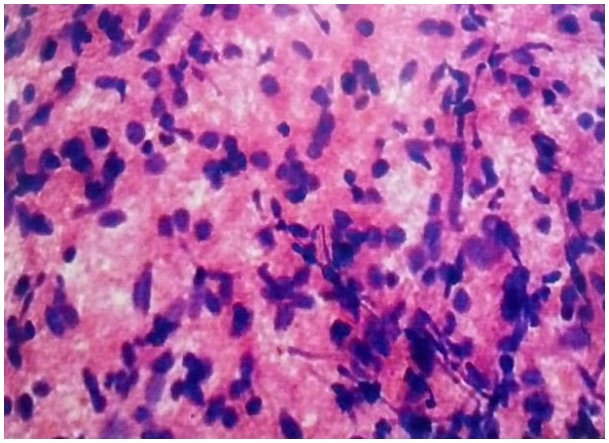

Fig 2: Anaplastic astrocytoma-Nuclear pleomorphism, coarse chromatin and frequent mitotic figures(H&E,400X)

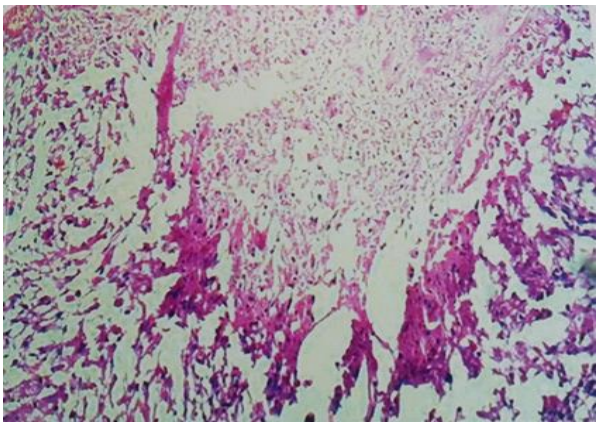

Fig 3: Glioblastoma multiforme-Pallisadind of tumor cells around necrosis(H&E,100X)

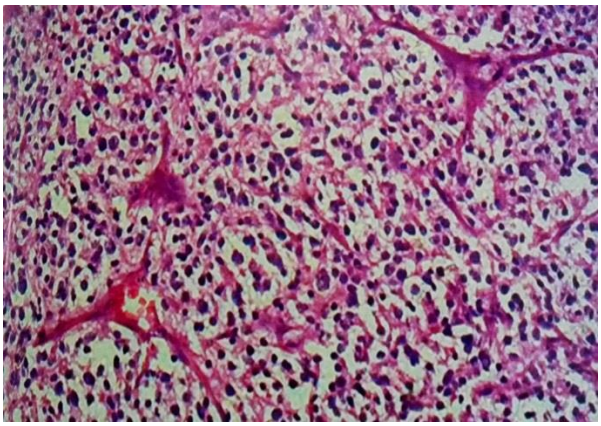

Fig 4: Oligodendroglioma-Uniform round nuclei with peri nuclear halo and chicken wire blood vessels(H&E,400X)

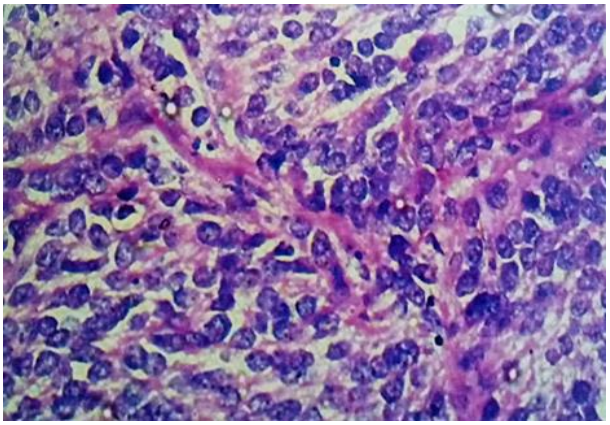

Fig 5: Medulloblastoma -Hyperchromatic small round cells(H&E,400X

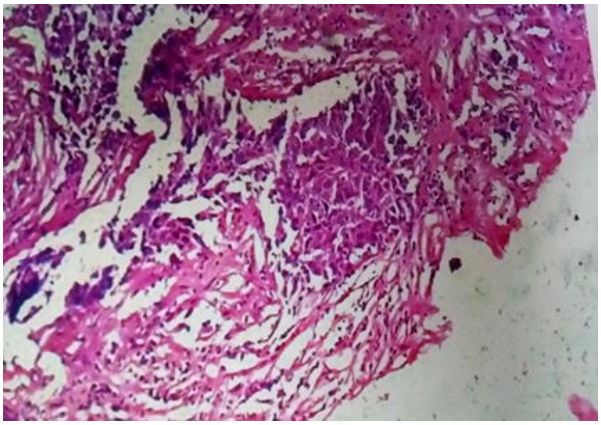

Fig 6: Metastatic poorly differntiated suamous cell carcinoma(H&E,100X)

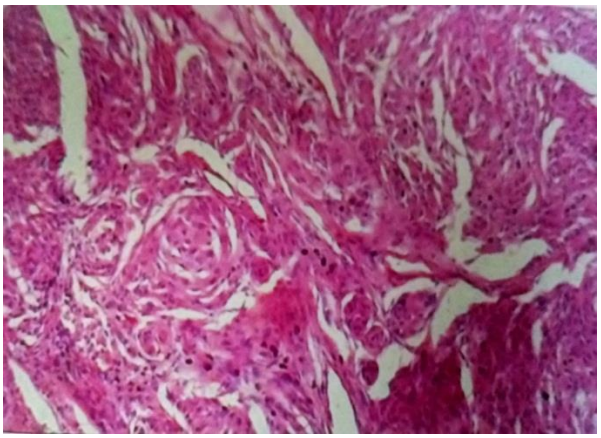

Fig 7: Meningothelial meningioma(H&E,400X)

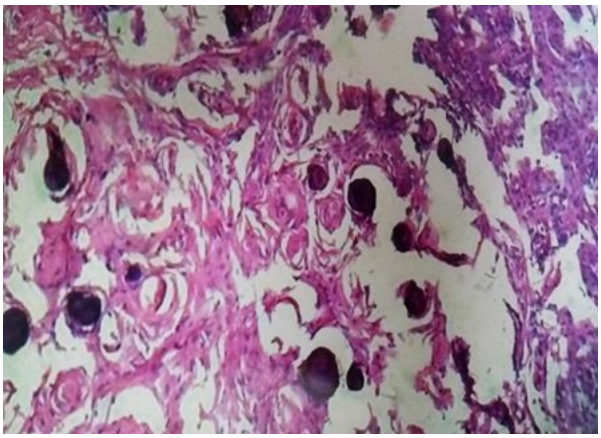

Fig 8: Psammomatous meningioma(H&E,100X))

RESULTS AND DISCUSSION

In our study total samples from 56 cases were analysed and it was found that age range was 3-74 years. Most common age group affected was between 31-40 years and 11-20 years. The mean age was 35.94 years. Males were commonly affected with Male to female ratio was found to be 1.15:1.

Bimal patel et al. In their study found that mean age of presentation was 45.9 years and age range was 8-71 years, with male predominace, M:F ratio being 2.3:1.[8]

Tamkeen Masoodi et al. In their study found that mean age was 43.29 years, age range was 4 to 82 years and most common age group affected was 31-50 years. Males were frequently affected with M:F ratio being 1.12:1.[1]

DR. Joel et al in their study foundthat age range was 5-70years and peak between 30 and 50 years. Males were frequently affected with M:F ratio being 1.4:1.[9]

Sajeeb mondal et al in their study found that mean age was 42.38 age range between 4-78 years with male predominance.[10]

Dr.Swaroop et al. In their study found that mean age was 47.16years and age ranged from 21 days to 78 years. Males were commonly affected with M:F ratio 1.44:1.[11]

In our study Intracranial tumors (91%) were most common than intraspinal tumors (8%). Among intracranial tumors, supratentorial (92.15%) were more common than infratentorial (7.84%). Frontal lobe (25%) was most common affected site followed by frontoperital region (19%). Headache (30%) was most common symptom followed by vertigo.

DR.Joel et al in their study found that CNS neoplasms occurred predominantly intracranially 42 cases (84%), whereas the remaining 8 cases (16 %) were spinal (ratio: 5.25:1) The commonest presenting symptoms were headache, motor weakness and seizures. Frontal lobe was the commonest intracranial site (37.5%) and dorsal region the most frequently involved site in spinal cord tumors.[9]

Tamkeen Masoodi et al. In their study found that CNS neoplasms occurred predominantly intracranially in 86.8% cases and spinal tumors constituted 13.2% cases. The commonest presenting symptoms were headache (60.3%), motor weakness (35.8%) and seizures (31.1%). Frontal lobe was the commonest intracranial site (20.7%) and dorsal region, the most frequently (42.9%) involved site in spinal cord.[1]

Dr.Swaroop et al. In their study found that CNS tumours affect predominantly intracranial location than spinal cord. Multilobe of cerebrum (30%) and frontal lobe are commonly affected.

Supratentorial location of intracranial tumours was seen in 83.33% of cases and infratentorial location in 16.67% of cases.[11]

In our study Neuroepithelial tumors are the commonest CNS tumors. Histologically Astrocytoma (41%) constituted the maximum number of cases followed by meningioma (28%).Metastatic tumors constituted 7% of cases.

DR. Joel et al in their study found that Histologically, of the CNS tumors, meningiomas constituted the maximum number of cases, 18 cases (42.8%) followed by astrocytoma (33.3%). Among the spinal tumors schwannoma constituted 50 % of cases.[9]

Tamkeen Masoodi et al. In their study found that Tumors of the neuroepithelial tissue were the commonest comprising 53.7%. Astrocytic tumors were the commonest neuroepithelial tumors (77.1%) with glioblastoma forming the largest subtype of astrocytic tumors (40.9%) with a mean age at diagnosis being 50 years.[1]

Dr.Swaroop et al. In their study found that Histopathological spectrum of CNS tumours encountered was neuroepithelial tumours (41%), followed by meningioma (18%), schwannoma (16%), metastasis (6%), pituitary adenoma (6%), DLBCL (4%), craniopharyngioma (3%), plexiform neurofibroma (3%) and hemangioblastoma (3%). Metastasis (6 cases) was equally distributed between brain (50%) and spinal cord (50%).[11]

CONCLUSION

This study has highlighted the relative frequency of different CNS tumors in Ajmer region. Preoperative clinical evaluation, adequete imaging by MRI and CT scan of patient are essential for optimal management of patient.

It is apparent there will always be a need for histopathology to confirm the diagnosis of CNS neoplasm.

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