

Original Research Article

Epidemiological & Histopathological Study of Cerebrospinal Lesions

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ABSTRACT

An anterospective study was carried out at M P Shah medical College Jamnagar to know histomorphology and epidemiology of various central nervous system lesions. Specimens were processed in pathology department and are classified morphologically according to the WHO Classification of central nervous system tumors 2007. Total 20 cases were analyzed over a period of three months. The study revealed more prevalence in 4th decade of life (30-39yrs) with predominance of female patients M: F ratio 0.81:1 also astrocytic tumors were most common amongst the CNS lesions.

Keywords: Neurosurgery, CNS lesions, Astrocytoma, meningioma, oligodendroglioma, glioma, histopathology, H&E stain, PAS stain, Reticulin stain.

INTRODUCTION

Neurosurgery as an independent field developed at the turn of 19th century. In Great Britain Sir Victor Horsely became the first surgeon to specialize largely in Neurological surgery.

Sir Harvey Cushing was a remarkable individual, who just deserves his title as the father of modern neurosurgery. [1]

To even the least introspective, the brain is an organ of enormous structural and physiologic complexity and unparalleled subtlety are manifested in the pathology of brain and this can make neuropathology seem very intimidating and obscure to the uninitiated.

However much of the apparent obscurity is the only reflex ion of the difference between the brain and other organs, and once these are appreciated many of the difficulties disappear.

Nervous system diseases fall into two general groups, one of them is a process

such as infection, trauma and neoplasm which occurs in the nervous system and the other organs.

In the present study little effort is made to understand and diagnose some SOLs found out during the period of March-06 to April-06, with kind co-operation of neurosurgeon and support of the emerging techniques.

Limitations of the short duration and less no of cases studied should be regretted.

The present study consists of 20 cases of Central Nervous System lesions. The patients were admitted in Guru Govind Singh Hospital affiliated with Shri M P Shah Medical College, Jamnagar from March 2006 to May 2006.

MATERIALS AND METHODS

The patients were operated and admitted in neurosurgery department, tissue was collected in 10% formalin to achieve proper fixation then processed by tissue processing method using graded alcohol,

xylene and wax. Tissue sections of 4-5 um thicknesses were taken and stained by Hematoxylin and Eosin. Special stains like Reticulin and PAS were done.

OBSERVATION AND RESULTS

Table1: Age and Gender Incidence.

| Age And Gender Incidence | | | | |
|--------------------------|-----------------|----------------|-----------|---------------|
| Age (Years) | Gender | | Total | Percent |
| | Male | Female | | |
| 00-09 | 01 | 03 | 04 | 20 |
| 10-19 | 01 | 01 | 02 | 10 |
| 20-29 | 02 | 00 | 02 | 10 |
| 30-39 | 01 | 04 | 05 | 25 |
| 40-49 | 02 | 01 | 03 | 15 |
| 50-59 | 01 | 01 | 02 | 10 |
| 60-69 | 01 | 01 | 02 | 10 |
| Total | 09 (45%) | 11(55%) | 20 | 100.00 |

Table 1 shows 09 (45%) male and 11 (55%) female. In gender incidence male/female ratio was 0.81:1, overall female predominance observed with maximum incidence in fourth decade.

Table 2: Clinical Symptoms In Various Lesions

| Clinical Symptoms In Various Lesions | | |
|--------------------------------------|-------|---------|
| Symptoms | Cases | Percent |
| Headache | 09 | 45 |
| Vomiting | 06 | 30 |
| Weakness Of Limbs | 06 | 30 |
| Convulsion | 05 | 25 |
| Hemiparesis / Plegia | 06 | 30 |
| Altered Behavior | 05 | 25 |
| Visual Disturbance | 03 | 15 |
| Difficulty In Walking | 04 | 20 |
| Backache | 03 | 15 |
| Tingling And Numbness | 04 | 20 |
| Slurred Speech | 03 | 15 |
| Bladder/Bowel Disturbances | 03 | 15 |

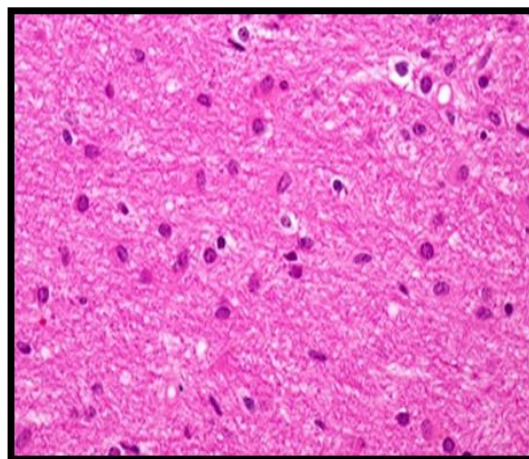


Figure 1: Fibrillary astrocytoma.

Table 2 shows Headache 09 cases (45%) was the commonest symptom followed by vomiting 06 cases (30%), weakness of limbs 06 cases (30%)

Table 3: Distribution of lesions according to site

| Distribution of lesions according to site | | |
|---|-------|---------|
| Site | Cases | Percent |
| Frontal | 05 | 25 |
| Temporal | 02 | 10 |
| Parietal | 01 | 05 |
| Fonto Parietal | 02 | 10 |
| Parieto temporal | 02 | 10 |
| Ventricles | 01 | 05 |
| Spinal | 03 | 15 |
| Meningeal | 04 | 20 |

Table 3 shows Cranial Space Occupying Lesions (SOL) comprised of 12 cases (55%) cerebral, and one case (5%) ventricular lesions. Spinal lesions numbered 3cases (15%), while meningeal lesions were 4 (20%), so amongst total 20 CNS lesions 17 (85%) were cranial and 3 (15%) spinal.

Table 4: Morphology of lesions

| Morphology of lesions | | |
|------------------------------------|-------|---------|
| Type | Cases | Percent |
| Astrocytoma | 04 | 20 |
| Oligodendroglioma | 02 | 10 |
| Meningioma | 04 | 20 |
| Craniopharyngioma | 01 | 05 |
| Choroid plexus papillary carcinoma | 01 | 05 |
| Langerhans cell histiocytosis | 01 | 05 |
| Peripheral t cell lymphoma | 01 | 05 |
| Dermoid cyst | 01 | 05 |
| Lipomeningocele | 01 | 05 |
| Brain abscess | 04 | 20 |

Table 4 shows Astrocytoma 04 cases(20%) with meningioma 04 cases (20%) and brain abscess 04 cases (20%) were the commonest lesions

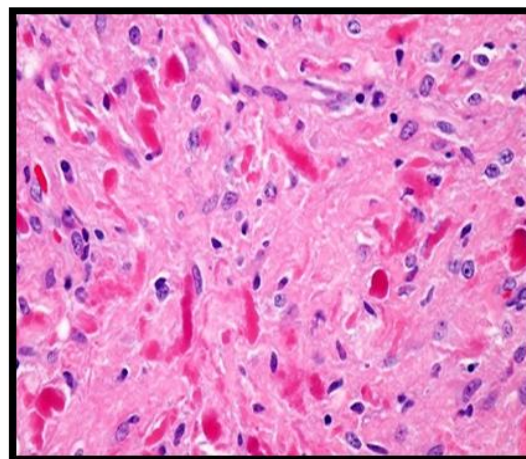


Figure 2: Pilocytic astrocytoma.

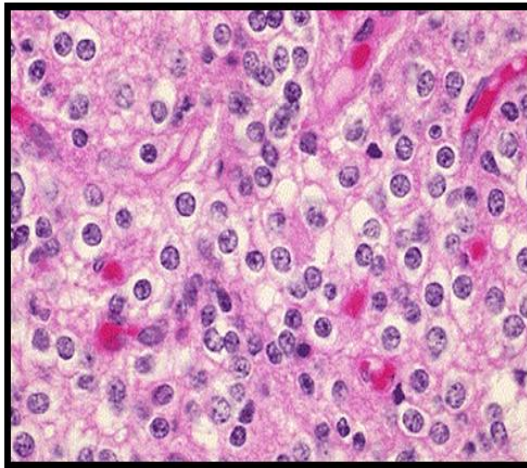


Figure 3: Oligodendroglioma.

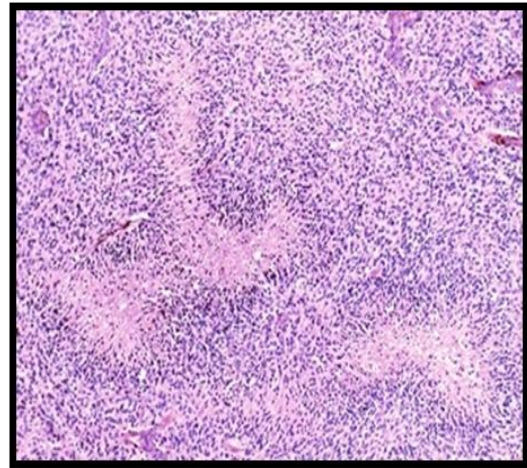


Figure 4: Necrosis in Glioblastoma.

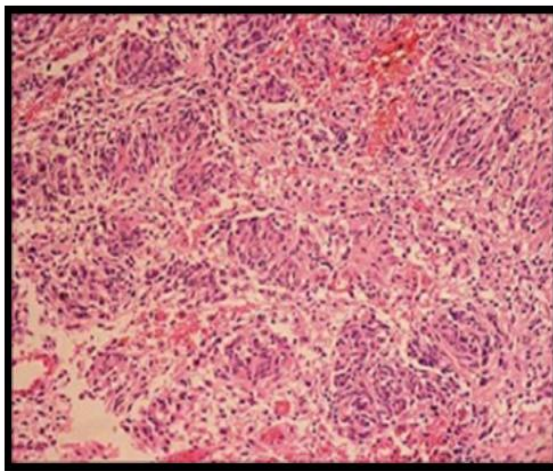


Figure 5: Meningioma.

DISCUSSION

Table 5: Peak incidence of age group

| Authors | Peak age incidence |
|--|--------------------|
| Ferrari G et al [2] | Sixth decade |
| Sutherland GR et al [3] | Seventh decade |
| Wen-qing et al [4] | Fourth decade |
| National programme of cancer registries data [5] | Ninth decade |
| Nibhoria et al [6] | Fourth decade |
| Present study | Fourth decade |

Ferrari G et al [2] studied that peak age incidence of CNS lesions was in sixth decade; Sutherland GR et al [3] studied that peak age

incidence of CNS lesions was in seventh decade, Wen-qing et al [4] studied

that peak age incidence of CNS lesions was in fourth decade,

National programme of cancer registries data [5] studied that peak age incidence of CNS lesions was in ninth decade,

Nibhoria et al [6] studied that peak age incidence of CNS lesions was in fourth decade; present study was correlated with Wen-qing et al [4] and Nibhoria et al. [6]

Table 6: Gender distribution

| Author | Male | Female | M:F |
|-----------------------|------|--------|--------|
| Andrew NB et al [7] | 14 | 16 | 0.87:1 |
| Materljan E et al [8] | 102 | 73 | 1.4:1 |
| Nibhoria et al [6] | 65 | 35 | 1.8:1 |
| Present study | 09 | 11 | 0.81:1 |

Andrew NB [7] et al studied that male patients were 14 and female patients were 16 with M: F ratio 0.87:1

Materljan E [8] et al studied that male patients were 102 and female patients were 73 with M: F ratio 1.4:1

Nibhoria et al [6] studied that male patients were 14 and female patients were 16 with M: F ratio 0.81:1

Present study results are consistent with Andrew NB et al [7] and Nibhoria et al [6]

Table 7: Symptom presentation

| Author | Symptom | | |
|------------------------------------|--------------------------|----------------------|-------------------------|
| Andrew NB et al [7] | Hemiplegia/paresis (62%) | Convulsion (31%) | Headache (27%) |
| Naziruddin Mollah et al [9] | Headache (76%) | Mental changes (64%) | Vomiting (52%) |
| Shokouh Taghipour Zahir et al [10] | Headache (60.8%) | Convulsion (15.7%) | - |
| Present study | Headache (45%) | Vomiting (30%) | Weakness of limbs (30%) |

Andrew NB et al [7] studied that hemiplegia/hemiparesis was the common symptom followed by convulsions and headache.

Naziruddin Mollah et al [9] studied that headache was the common symptom followed by Mental changes and Vomiting. Shokouh Taghipour Zahir et al [10] studied that headache was the common symptom followed by Convulsion

Present study showed hemiplegia/hemiparesis was the common symptom followed by Headache and Convulsion

Andrew NB et al [7] studied that frontal lobe was the common location followed by temporal lobe,

Crowley MJ et al [11] studied that frontal lobe was the common location followed by Parietal and Temporal lobe

Shokouh Taghipour Zahir et al [10] that frontal lobe was the common location followed by Parietal lobe

Present study showed that frontal lobe was the common location followed by temporal lobe and parietal lobe.

Table 8: Location of SOL

| Author | Location of SOL | | |
|------------------------------------|-----------------|----------|----------|
| Andrew NB et al [7] | Frontal | Temporal | - |
| Crowley MJ et al [11] | Frontal | Parietal | Temporal |
| Shokouh Taghipour Zahir et al [10] | Frontal | Parietal | - |
| Present study | Frontal | Temporal | Parietal |

Table 9: Morphological type

| Author | Morphological type. | | |
|-------------------------|---------------------|-----------------------|-------------------------|
| Sutherland GR et al [3] | Astrocytoma (43%) | Meningioma (22%) | Pituitary Adenoma (17%) |
| Staneczek W et al [12] | Glioma (38.7%) | Medulloblastoma (14%) | Ependymoma (10.2%) |
| Rosenberg S et al [13] | Astrocytoma (14%) | Medulloblastoma (11%) | Craniopharyngioma (11%) |
| Present Study | Glioma (35.29%) | Meningioma (23.52%) | |

Sutherland GR et al [3] studied that most common tumor type were astrocytoma followed by meningioma and pituitary adenoma.

Staneczek W et al [12] studied that most common tumor type were Glioma followed by Medulloblastoma and Ependymoma.

Rosenberg S et al [13] studied that most common tumor types were astrocytoma followed Medulloblastoma and Craniopharyngioma.

Present study showed that that most common tumor types were Glioma followed Meningioma.

CONCLUSION

Present study 20 cases of central nervous system lesions were studied in the Department of Pathology, Shri M.P. shah Medical College Jamnagar from the time period of March '06 to May '06.

Tissue specimens were obtained by craniotomy procedure done by neurosurgeon. Histopathological examination including histochemistry was done in pathology department.

The age of patients varied from 07 month old to 65 yrs of age.

Maximum incidence was recorded in fourth decade (30-39 years).

Male: Female ratio was 0.81:1,

Headache was the commonest symptom followed by vomiting, weakness of limbs.

Cranial lesions comprised of 12 cerebral, one ventricular, meningeal lesions 4 and Spinal lesions 3.

Commonest morphological lesion was astrocytoma followed by meningioma and brain abscess.

Over all comparative study showed that glial tumors were commonest among CNS lesions.

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