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Histopathological Study of Tumors of Central Nervous System

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Abstract

Background: *A brain tumor occurs when abnormal cells from within the brain. There are two main types of tumors: malignant and benign tumors. This study was aimed to determine the types of brain tumor in study population.*

Materials & Methods: *This study was conducted in the department of general pathology on 112 specimens submitted to the department. The diagnosis was made on HPE of routinely processed tissue. The H&E stained sections in all cases were reviewed and diagnosis was confirmed applying revised WHO classification.*

Results: *Site distribution was cerebro parietal (35), cerebro frontal (25), cerebro temporal (8), cerebro occipital (5), cerebellum (10), pons (8), cerebellopontine angle (17) and spinal cord region (4). The difference was significant (P-0.01). Common CNS neoplasms were astrocytoma (33), meningioma (21), schwannoma (10), oligodendroglioma (12), medulloblastoma (6), neurofibroma (9), craniopharyngioma (5), ependymoma (6) and metastatic tumor (10). The difference was significant (P-0.01).*

Conclusion: *Astrocytoma was most common CNS neoplasm. Females had higher prevalence than males. Cerebro parietal region was commonly involved.*

Keywords: *Astrocytoma, Brain, Neoplasm.*

Introduction

Human brain is controlling all the processes in the body and is considered to be the main centre of the body. It provides all the signals to the organs to perform various functions. Different parts of the brain are performing specific functions.[1]

Lesion of the brain may involve any part. With the variation in histopathology, tumors of brain differs itself from other body part tumors. Tumors of CNS are very rare. The incidence in 2002 was 3.7 per lacs in males and 2.6 per lacs in females. The frequency was higher in developed countries than in developing countries.[2] With the change in cell type, the tumor cells perform abnormal function. There are two main types of tumors: malignant or cancerous tumors and benign tumors. Cancerous tumors can be divided into primary tumors that start within the brain, and secondary tumors that have spread from somewhere else, known as brain metastasis tumors. The most important symptoms are headaches which are seen in 80% of the population. The headache is classically worse in the morning and goes away with vomiting. Other includes seizures, altered vision, vomiting, and

mental changes. Difficulty in walking, speaking, and abnormal sensation may be observed. Unconsciousness may occur in severe cases.[3]

The number of cases of brain tumor is not exactly known. The reason being the lack of complete registration of newly diagnosed cases with local cancer registries. In India, to know the exact prevalence, the source of information is hospitals. With increased availability of diagnostic facilities and better healthcare, the incidence of CNS tumors seems to be on the rise in developing countries. All the CNS tumors were divided into seven categories: Tumors of neuroepithelial tissue; tumors of the cranial and paraspinal nerves; tumors of the meninges; lymphomas and hematopoietic neoplasms; germ cell tumors; tumors of the sellar region; and metastatic tumors.[4] This study determined the types of brain tumor in study population.

Materials & Methods

This study was conducted in the department of general pathology. It included 112 specimens submitted to the department. Ethical clearance was taken prior to the study. The diagnosis was made on HPE of routinely processed tissue. The H&E stained sections in all cases were reviewed and diagnosis was confirmed applying revised WHO classification. Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

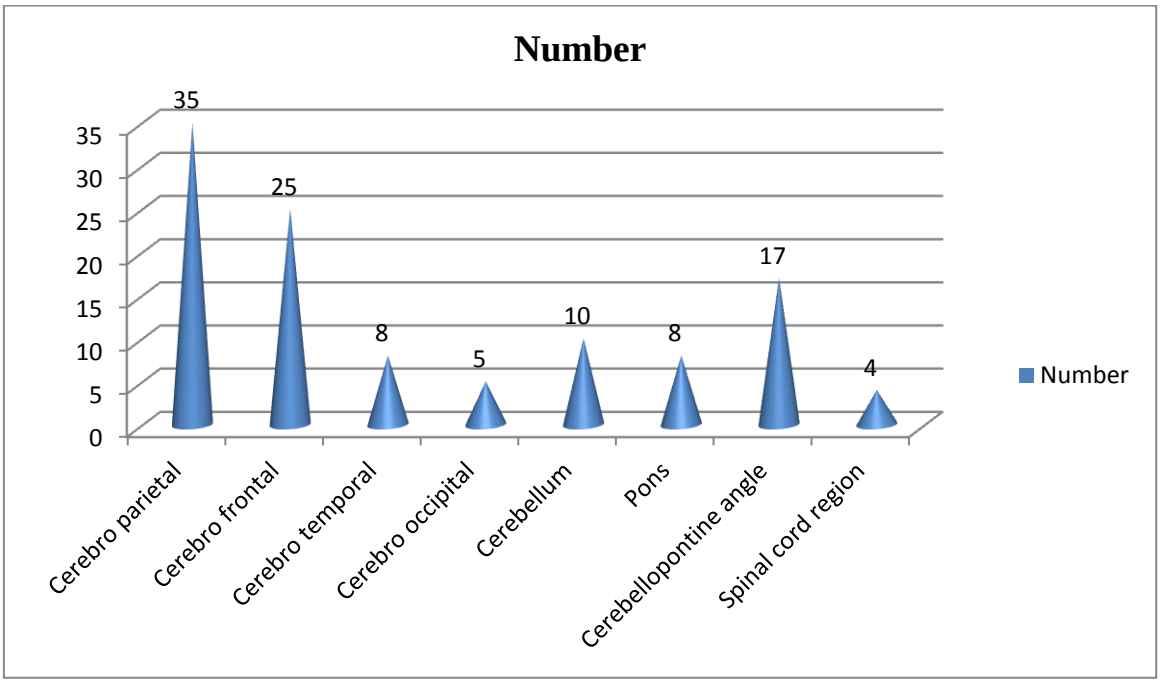
Results

Table I Distribution of subjects

	Total- 112	
Males	Females	P value
52	70	0.21

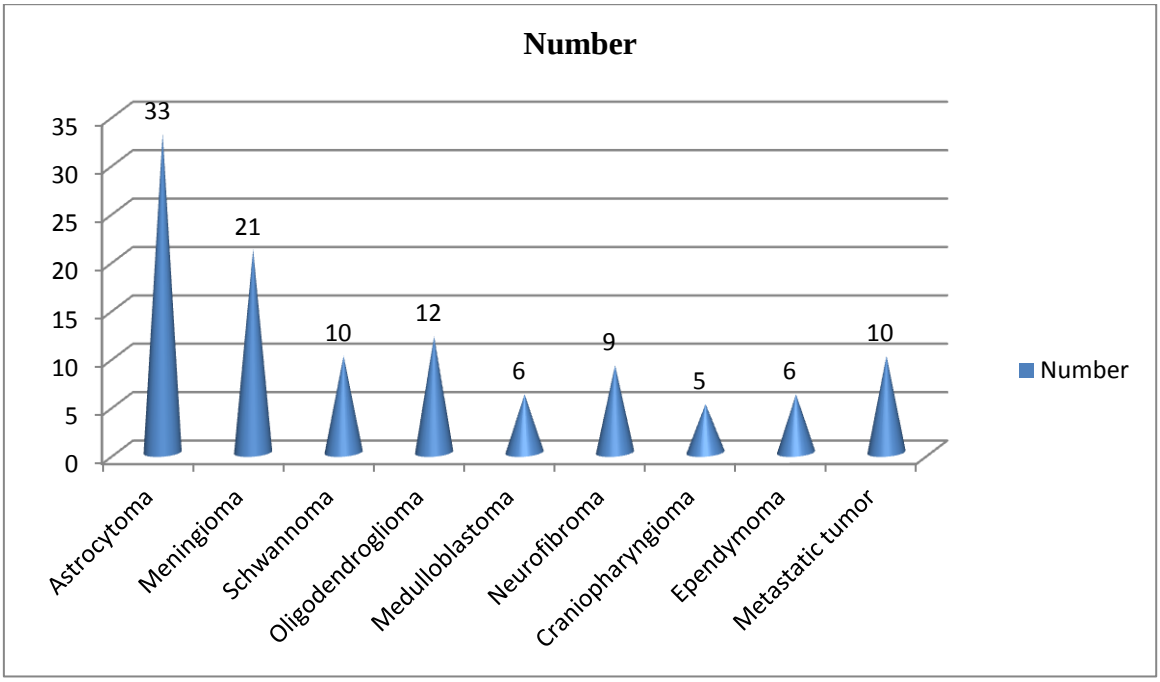
Table I shows that out of 112 specimens, 52 were of males and 70 were of females. The difference was non- significant (P-0.21).

Graph I Site distribution of specimens



Graph I shows that site distribution was cerebro parietal (35), cerebro frontal (25), cerebro temporal (8), cerebro occipital (5), cerebellum (10), pons (8), cerebellopontine angle (17) and spinal cord region (4). The difference was significant (P-0.01).

Graph II Major CNS neoplasms



Graph II shows that common CNS neoplasms were astrocytoma (33), meningioma (21), schwannoma (10), oligodendroglioma (12), medulloblastoma (6), neurofibroma (9), craniopharyngioma (5), ependymoma (6) and metastatic tumor (10). The difference was significant (P-0.01).

Discussion

Brain tumors are rare to occur. As the prevalence is low, there is no specific data available to us. The signs and symptoms are variable depending upon the involvement of site, location and rate of growth of the tumor. Primary and secondary brain tumors present with similar symptoms. Tumor in the frontal lobe leads to changes in the ability to think. However, a smaller tumor in an area such as Wernicke's area can result in a greater loss of function.[5] This study determined the types of brain tumor in study population.

We found that out of 112 specimens, 52 were of males and 70 were of females. Common site involved was cerebro parietal, cerebro frontal, cerebro temporal, cerebro occipital, cerebellum, pons, cerebellopontine angle and spinal cord region. This is in agreement with Duncan.[6] We observed that common CNS neoplasms were astrocytoma, meningioma, schwannoma, oligodendroglioma, medulloblastoma, neurofibroma, craniopharyngioma, ependymoma and metastatic tumor. This is similar to Pal AK.[7]

Astrocytoma is a brain tumor. Due to involvement of star shaped glial cell which is known as astrocytes. Astrocytomas can occur at any part of the brain and remain localized in the brain. There is no spread of tumor outside the brain. Meningiomas are tumors of meninges of the brain which is the covering of the brain. It includes duramater, piamater and arachnoid matter. Any of the meninges may show involvement. It is not fast growing. Symptoms depend on the location and occur as a result of the tumor pressing on nearby tissue.[8]

A schwannoma involves the Schwann cells is usually a benign tumor. It is slow growing tumor and 99% of tumors are benign in nature and only 1% are malignant. The tumor cells always stay on the outside of the nerve, but the tumor itself may either push the nerve aside and/or up against a bony structure.[9]

Oligodendrocytes are glial precursor cell causing oligodendrogliomas. >90% are seen in adults and only 4% are found in children. Medulloblastomas are rapidly growing tumors. They are noninvasive in nature. The mode of spread is cerebrospinal

fluid and frequently metastasizes to different locations along the surface of the brain and spinal cord. Metastasis all the way down to the cauda equina at the base of the spinal cord is termed "drop metastasis".[10] Craniopharyngioma (Rathke pouch tumors) is a type of brain tumor derived from pituitary gland embryonic tissue. Other name is hypophyseal duct tumors. It is mostly seen in children but adults may also show occurrence. Patient usually complains of bitemporal hemianopsia due to compression of the optic chiasm.[11]

Conclusion

Astrocytoma was most common CNS neoplasm. Females had higher prevalence than males. Cerebro parietal region was commonly involved.

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