

STUDY OF HISTOPATHOLOGIC ANALYSIS OF BRAIN TUMOURS AT TERTIARY CARE HOSPITAL IN NORTH MAHARASHTRA

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Abstract

Background: The present study was conducted for histopathologic analysis of primary brain tumours (PBT). **Materials and Methods:** A total of 100 patients with primary brain tumours were enrolled from ACPM medical college from July 2020 to June 2023 and from Maharashtra Postgraduate Institute of Medical Education and Research (MPGIMER), Nashik from July 2022 to June 2023. Complete demographic and clinical details of all the patients were obtained. After receiving the specimen at our histopathology laboratory, the specimens were fixed for overnight in 10% buffered formalin. After fixation, the tissue was processed, and blocks were prepared. This was followed by sectioning and mounting over a glass slide and stained with routine hematoxylin and eosin stains. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software. **Results:** 68 percent of the patients were males while the remaining were females. Astrocytic tumours, Oligodendroglial tumours, Ependymal tumours, Meningothelial tumours, Fibroblastic tumours, Hemangioblastomas and Hemangiomas were seen in 34 percent, 7 percent, 9 percent, 23 percent, 12 percent, 2 percent and 3 percent of the patients respectively. Non-significant results were obtained while comparing the histopathological diagnosis of brain tumours with gender. **Conclusion:** Majority of the patients with brain tumours were males with neuroepithelial tumours being the most common type of tumours encountered.

INTRODUCTION

Brain tumors are common, requiring general medical providers to have a basic understanding of their diagnosis and management. The most prevalent brain tumors are intracranial metastases from systemic cancers, meningiomas, and gliomas, specifically, glioblastoma. Central nervous system metastases may occur anywhere along the neuroaxis, and require complex multidisciplinary care with neurosurgery, radiation oncology, and medical oncology. Meningiomas are tumors of the meninges, mostly benign and often managed by surgical resection, with radiation therapy and chemotherapy reserved for high-risk or refractory disease.^[1-3]

Another common PBTs are Gliomas, a type of tumour that starts in the glial cells of the brain or the spine. Astrocytomas are the most common form of gliomas. The disruption of the blood– brain barrier (BBB), which can easily be detected on contrast-enhanced magnetic resonance imaging (MRI) and computed tomography (CT), is regarded as the main

diagnostic indicator for malignant gliomas, meningiomas, and brain metastases, as well as for some less frequent tumors without an intact BBB. As a consequence of the exclusion of all radiotracers that cannot pass the BBB from normal brain, there usually also is a good tumor-to-brain contrast for all tracers with these properties, which historically included ^{99m}Tc-pertechnetate and ⁶⁸Ga-diethylene triamine pentaacetic acid, and currently also fluorothymidine (FLT) and virtually all labelled macromolecules (although low-capacity slow-specific transfer by receptors has been observed for some).^[4-6] Hence; the present study was conducted for histopathologic analysis of primary brain tumours.

MATERIALS AND METHODS

A total of 100 patients with primary brain tumours were enrolled from ACPM medical college from July 2020 to June 2023 and from Maharashtra Postgraduate Institute of Medical Education and Research (MPGIMER), Nashik from July 2022 to

June 2023. Complete demographic and clinical details of all the patients were obtained. After receiving the specimen at our histopathology laboratory, the specimens were fixed overnight in 10% buffered formalin. After fixation, the tissue was processed, and blocks were prepared. This was followed by sectioning and mounting over a glass slide and stained with routine hematoxylin and eosin stains. All the sections were examined by an experienced pathologist. Grading of all the tumors was done as per WHO 2007 classification of tumors of the Central Nervous System (CNS).^[7] All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software.

RESULTS

A total of 100 patients were analysed. Mean age of the patients was 46.78 years. Majority of the patients belonged to the age group of 40 to 50 years. Out of 100 patients, 68 percent of the patients were males while the remaining were females. Astrocytic

tumours, Oligodendroglial tumours, Ependymal tumours, Meningothelial tumours, Fibroblastic tumours, Hemangioblastomas and Hemangiomas were seen in 34 percent, 7 percent, 9 percent, 23 percent, 12 percent, 2 percent and 3 percent of the patients respectively. Non-significant results were obtained while comparing the histopathological diagnosis of brain tumours with gender.

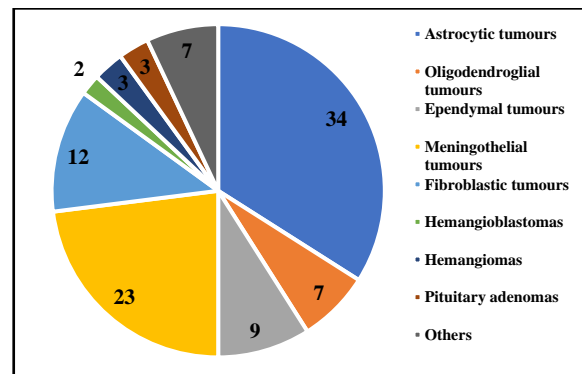


Figure 1: Histopathological diagnosis

Table 1: Histopathological diagnosis

Histopathological diagnosis		Number	Percentage
Neuroepithelial tumours	Astrocytic tumours	34	34
	Oligodendroglial tumours	7	7
	Ependymal tumours	9	9
Tumours of meninges	Meningothelial tumours	23	23
	Fibroblastic tumours	12	12
Mesenchymal tumours	Hemangioblastomas	2	2
	Hemangiomas	3	3
	Pituitary adenomas	3	3
Others		7	7
Total		100	100

Table 2: Gender-correlation of brain tumours

Histopathological diagnosis	Males	Females	Total
Neuroepithelial tumours	34	16	50
Tumours of meninges	23	12	35
Mesenchymal tumours	6	2	8
Others	5	2	7
Total	68	32	100
p-value	0.115		

DISCUSSION

Primary Brain tumor is an intracranial neoplasm that occurs in the brain or the central spinal canal. An abnormal and uncontrolled cell division, usually in the brain, involving neurons or glial cells (which include astrocytes, oligodendrocytes, and ependymal cells) or occasionally in the lymphatic tissue, blood vessels, cranial nerves, brain envelopes (meninges), skull, pituitary gland, or pineal gland is the main leading cause of formation of primary brain tumors (PBTs). Brain metastases comprise the majority of brain tumors, with their incidence estimated to be 10 times more common than primary brain tumors, although comprehensive data on their epidemiology are lacking.^[7-9] The most common systemic malignancies to metastasize to the brain are lung cancer, breast cancer, and melanoma. Primary malignant brain tumors affect about 200,000 people

worldwide every year. These tumors include the worst elements of cancer with the most serious neurological diseases. Brain tumors can affect anyone at any age with devastating and lethal effects. So, a major public health problem is caused by these tumors.^[10-12] Hence; the present study was conducted for histopathologic analysis of brain tumours.

A total of 100 patients were analysed. Mean age of the patients was 46.78 years. Majority of the patients belonged to the age group of 40 to 50 years. Out of 100 patients, 68 percent of the patients were males while the remaining were females. Astrocytic tumours, Oligodendroglial tumours, Ependymal tumours, Meningothelial tumours, Fibroblastic tumours, Hemangioblastomas and Hemangiomas were seen in 34 percent, 7 percent, 9 percent, 23 percent, 12 percent, 2 percent and 3 percent of the patients respectively. Non-significant results were obtained while comparing the histopathological

diagnosis of brain tumours with gender. In cancers with poor prognosis, such as glioblastoma, where conventional surgery, chemotherapy, and radiation regimens constitute little more than palliative measures, the use of replicating viruses as a promising experimental treatment strategy may be warranted, especially if the benefits outweigh the potential risks.^[9-12] Mohammed AA et al characterize the histopathological types and basic demographic parameters of brain tumors. The most common histopathological diagnosis in their study was meningioma (30.8%), followed by astrocytic tumors (29.1%), metastatic tumors (7.7%), and embryonal tumors (6.6%). The meningotheial meningioma was the most common type of meningioma (48.5%). The majority of astrocytic tumors (52%) fell under the WHO Grade IV.¹² Kanthikar SN et al, in another study, diagnosed and classified brain tumours according to WHO 2007 classification. Among 38 cases, tumours of meningeal tissue (40%) were commonest followed by neuroepithelial tissue (34%). Cranial and spinal nerve sheath tumour (18%) and rarely metastatic tumours (5.3%) were encountered. Tumours were seen in all age groups but mean age group affected was 41-50 years accounting for 14 (36.8%) cases. Male to female ratio of 0.81:1.22 was noted with female preponderance.^[13] Hamdani AM et al highlighted the histopathological spectrum of brain tumors in a single tertiary care center. A total of 117 neurosurgical biopsies were retrieved from the archives of the department. The relative frequency of tumors and the distribution as per age, sex, and location of the lesion were analyzed. A wide range of histopathological spectrum of CNS tumors was observed and was classified according to the WHO classification system of 2007. The primary CNS tumors were graded from Grade I to Grade IV. Overall tumors of meninges (41.02%) were the most common entity followed by the astrocytic tumors (35.04%). Their study helped to provide information regarding the burden of disease in their study.^[14]

CONCLUSION

Majority of the patients with brain tumours were males with neuroepithelial tumours being the most common type of tumours encountered.

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