

Prevalence of Primary Brain Neoplasms and Neoplasm-Like Lesions Reported at Central Pathology Laboratory, Peshawar- A Retrospective Study

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Abstract

Objectives: The aim of present study is to know the frequency of primary brain tumors and tumor like lesions reported at Central Pathology Laboratory, Peshawar.

Materials and Methods: The retrospective study was conducted by reviewing the biopsy reports from the files of Central Pathology Laboratory, Peshawar from 1st January 2017 to 30th Mar 2020.

The specimens were received in 10% formalin, stained with H & E and reported by 03 experienced histopathologists. A total of 153 biopsy reports were reviewed. In addition to morphological types of tumors, patients' demographic details like age and gender were also recorded. Data gathered was analyzed using SPSS Version.20.

Results: A total of 153 cases were reviewed. Out of these, 95 (62.09%) were males while 58(37.90%) were females with M: F ratio of 1.63:1 showing male predominance. Most of the patients (41.83%) were in the age range of 40 years and above. The mean age of study sample was 37.45+/- SD 17.64. The most common brain tumors were astrocytomas (41.83%), followed by meningiomas (27.45%) and oligodendrogliomas (6.53%).

Conclusion: Astrocytomas are the most common intracranial tumors in our study, followed by Meningiomas. Psychiatrists should always be vigilant in their clinical practice to rule out organic lesions including brain tumors.

Keywords: Brain tumors, Neoplasms

Cite as: Khan G, Ullah S. Prevalence of Primary Brain Neoplasms and Neoplasm-Like Lesions Reported at Central Pathology Laboratory, Peshawar- A Retrospective Study. BMC J Med Sci 2021. 2(2): 60-63.

Introduction

Primary brain tumours are a heterogeneous group of benign and malignant neoplasms that develop from the parenchyma of the brain and its surrounding structures. They are a significant cause of morbidity and mortality in both adults and children, leading to severe disabilities and burden on both families as well as overall health care systems¹. The annual global incidence of primary central nervous system (CNS) tumors has been estimated as 3.9 and 3.2 per 100,000 populations in males and females respectively.²

Primary brain tumors constitute 5-10% of all neoplasms. Location, size, type of tumor, degree of surrounding edema and age of patient are some of the factors that influence the clinical presentation of primary brain neoplasms. In most cases brain tumors present with specific neurologic signs due to mass

effect like headache, confusion, ataxia, nystagmus, nausea, vomiting, motor/sensory deficits, speech problems, cranial nerve palsies, papilledema and seizures.³ Infrequently, psychiatric symptoms may be the sole and primary presentation of brain tumors at times misleading even experienced psychiatrists and causing delay in proper management. Anxiety, mood symptoms, psychosis, memory issues, personality changes, and anorexia are some of the psychiatric symptoms. Depression was identified in 44 percent of all brain tumour patients, according to Mainio et al. Psychotic symptoms were found in 22 % with brain neoplasms in another report by Madhusoodanan et al. Frontal lobe neoplasms may at times present with personality changes like disinhibition, hypersexuality, and aggressive behaviors. According to some studies like Houy et al and Lin et al, brain tumors may present with anorexic symptoms leading to at times wrong diagnosis of Anorexia nervosa. Detailed neurological examination and

Authorship Contribution: ¹Final approval of the version to be published, revising it critically for important intellectual content

²Substantial contributions to the conception or design of the work drafting.

Funding Source: none

Conflict of Interest: none

Received: Aug 06, 2021

Accepted: Jan 02, 2022

neuroimaging studies like CT and MRI should therefore always be considered in all psychiatric cases to exclude underlying organic brain lesions.⁴ A recent Norwegian study revealed 32.8% clinically relevant findings on brain imaging in patients referred for psychiatric presentations⁵. The final diagnosis of brain tumors, however, require histopathological examination. Clinical clues which may suggest underlying brain tumors and require Neuroimaging studies include weight loss, anorexia without body dysmorphic symptoms, new onset personality changes, presence of neurological signs, new onset psychosis, new onset mood/memory symptoms, atypical symptoms not fitting into distinct diagnostic category, symptoms not responding to adequate psychiatric treatment and recurrence of previously remitted symptoms where other contributory factors (such as non-compliance to treatment, exposure to various psychosocial stressors, or medication changes) have been ruled out.⁴

The epidemiology of primary brain neoplasms is poorly studied in general globally and in Pakistan specifically. The current study will give an insight into the frequency, morphological patterns and some demographic parameters of different primary brain tumors in our region. This will in turn be of significant help to better plan the allocation of health resources for timely diagnosis and management of patients of brain tumors presenting with varying psychiatric symptoms.

Materials and Methods

This retrospective study was conducted by reviewing the biopsy reports from the files of Central Pathology Laboratory, Peshawar from 1st January 2017 to 30th September 2020. It is a well equipped laboratory which receives biopsy specimens from Afghanistan and all over KPK including Lady Reading Hospital and Irfan Hospital, a private hospital in Peshawar, where a large number of neurosurgical procedures are undertaken. The specimens were received in 10% formalin, processed in the routine way, stained with H & E and reported by 03 experienced histopathologists. A total of 153 biopsy reports were reviewed. In addition to morphological types of tumors, patients' demographic details like age and gender were also recorded. Patients' confidentiality was maintained throughout the study. The Statistical Program for Social Sciences (SPSS) Version.20 was used to examine the data. The Mean +/- SD was computed for continuous variables such as age. The patients were divided into 3 groups based on their ages: Group 1 (1-19 years), Group 2 (20-40 years), and Group 3 (beyond 40 years) (41 years and above). For the variables of categorical types like gender, frequencies and percentages were calculated. All the results are presented in the form of tables.

Results

During the study period, a total of 153 cases were reviewed. Out of these, 95 (62.09%) were males while 58(37.90%) were females with M: F ratio of 1.63:1 showing male predominance.

Most of the patients (41.83%) were in the age range of 40 years and above and the least number were in the age range (1-19 years). The mean age was 37.45+/- SD 17.64. The age range of the sample was 2 to 80 years. Based on histopathological reports, the most common brain tumors and tumor like lesions included astrocytomas (41.83%), followed by meningiomas (27.45%), oligodendrogliomas (6.53%), craniopharyngiomas (4.57%), medulloblastomas (3.92%), pituitary adenomas (3.92%), haemangioblastomas (2.61%), ependymomas (1.96%), schwannomas (1.96%), gliosarcomas (1.30%) etc. All the results are tabulated as under:

Table I: Gender wise distribution of Brain tumors/Tumor like lesions

Gender	Frequency	%ages
Males	95	62.09
Females	58	37.90

Table II: Age wise distribution of Brain tumors/Tumor like lesions

Age(Years)	Frequency	%ages
1.1-19	26	17
2.20-40	63	41.17
3.41 and above	64	41.83

Table III: Frequency wise distribution of Brain tumors and tumor like lesions

Tumor/tumor like lesions	Frequency	%ages
Astrocytoma	64	41.83
Meningiomas	42	27.45
Oligodendrogliomas	10	6.53
Craniopharyngiomas	7	4.57
Medulloblastomas	6	3.92
Pituitary adenomas	6	3.92
Haemangioblastomas	4	2.61
Ependymomas	3	1.96
Schwannomas	3	1.96
Gliosarcomas	2	1.30
Astroblastoma	1	0.65
Ganglioglioma	1	0.65
Neurofibroma	1	0.65
Choroid plexus carcinoma	1	0.65
Neurofibroma	1	0.65
Undifferentiated tumor	1	0.65

Discussion

Our study revealed male preponderance with overall male to female ratio of 1.63:1 which is in line with some previous studies like Jaiswal J et.al and Piñeros M et.al.^{6,7} The reason for male predominance in our study might, in addition to other factors, be a manifestation of decreased accessibility of females to health care services in developing countries. In our study, male predominance was seen for all brain tumors except meningiomas. Out of total 42 histopathologically confirmed cases of meningiomas, 25 (i.e. 59.52%) belonged to female

gender. This finding is in line with the findings in another study conducted by M Mehrazin et.al in Iran in which meningiomas were predominant among female cases.⁸ The increased frequency of meningiomas in females may be related to presence of estrogen and progesterone receptors in these tumors. ⁹ The male: female ratio of primary brain tumors in our study (i.e. 1.63:1) is nearly similar to that of a local study by Muhammad Sajjad et.al wherein M:F ratio was 1.55:1.¹⁰

Our study revealed most of the patients in age group 41 years and above. This finding is in accordance to another study conducted in Korea by Yun-Sik Dho et.al which revealed increase in primary brain tumor incidence rates with advancing age.¹¹ Another study conducted in India by N.Manoharan et.al showed increase in incidence of all brain tumors with advancing age with the highest number of brain tumors found in the age group of 45-54 years in both genders¹². Another study from India by Shivraj Nagnath Kanthikar supports the same findings.¹³

Children and adolescents contributed 17% of all brain tumors in the study sample with craniopharyngiomas and medulloblastomas as the most frequent tumors in this age group. In a retrospective study of primary brain tumors in children under 14 years of age conducted at PIMS, Islamabad by Saima Nasir et.al, the primary brain tumors were medulloblastomas, astrocytoma, mixed gliomas, craniopharyngioma, ependymoma, and pineal tumor.¹⁴

The mean age and standard deviation (37.45+/- SD 17.64) of our study is in the range of some other studies conducted in Pakistan. One such local study revealed a mean age of 37 (SD +/- 15.18 years) with age range of 9 to 70 years.¹⁰

In the present study, the most common tumor type were astrocytomas (41.83%) followed by meningiomas (27.45%), oligodendrogliomas (6.53%). Glioblastoma multiform also called Grade IV astrocytomas were the most frequent tumor type among astrocytomas contributing 45(70%) out of total 64 histopathologically confirmed cases of astrocytomas in the study sample. The findings of our study are in line with some other studies by Z Ahmed et.al, Sasank Ramanavarapu et.al and Sunday Sokunle Soyemi et.al.^{15, 16, 17} The findings in some studies by Sahabi Sadiku Malami et.al and Paul Jibrin et.al are not in conformity to our study with meningiomas as the most frequent brain tumors in these studies ^{18, 19}. This regional difference may probably be due to some unknown etiological factors which need further studies.

Conclusion

Astrocytomas are the most common intracranial tumors in our study, followed by Meningiomas. Psychiatrists should always be vigilant in their clinical practice to rule out organic lesions including brain tumors.

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