



## International Journal of Research and Development in Pharmacy & Life Science

An International open access peer reviewed journal

ISSN (P): 2393-932X, ISSN (E): 2278-0238

Journal homepage: <http://ijrdpl.com>



### Original Article

# Morphological Spectrum of Glial Tumors in J.A. Group of Hospitals, G.R. Medical College, Gwalior

Bhavna Karnwal, Raj Laxmi Sharma, Reena Jain and Bharat Jain

Department of Pathology, G.R. Medical College, Gwalior, India

**Keywords:** Brain tumors, glial tumors, haematoxylin, Astrocytomas

#### Article Information:

**Received:** March 13, 2018;

**Revised:** April 29, 2018;

**Accepted:** May 15, 2018

**Available online on:**

15.06.2018@<http://ijrdpl.com>



[http://dx.doi.org/10.21276/IJRDPL.2278-0238.2018.7\(3\).3011-3014](http://dx.doi.org/10.21276/IJRDPL.2278-0238.2018.7(3).3011-3014)

#### ABSTRACT:

**Background:** Brain tumors represent a unique, heterogenous population of neoplasms that include both benign and malignant tumors. International data depict that tumors of central nervous system account for 1- 2% of all neoplasm. This study was designed to assess the histopathologic spectrum of glial tumors in Indian population which will guide the clinicians to establish measures for an improved diagnosis and management protocols including the use of targeted chemotherapy for specific subtypes. **Method:** 117 cases of glial tumors who underwent neurosurgery for space occupying lesions of the brain were enrolled. After gross examination routine histological sections were made using haematoxylin and eosin stains. The diagnosis and grading were done according to WHO classification of CNS tumors. **Result:** Most common age of presentation of glial tumours was 31 -45 yrs age group (41%) followed by 46 -60 yrs (30.7%). Males were affected more commonly with sex ratio of 1.9:1. Astrocytomas were the most common glial tumours in our population with grade II astrocytoma being most common followed by grade III tumours. **Conclusion:** Among 117 cases which were analysed; 87 were Astrocytomas, 11 were Ependymoma, 12 were glioblastoma multiforme and 7 were oligodendroglioma. The knowledge of histopathologic spectrum of glial tumors in our population will guide the clinicians to establish measures for an improved diagnosis and management protocols.

↑ Corresponding author at:

**Dr. Raj Laxmi Sharma**, Associate Professor, Department of Pathology, G.R. Medical College, India

E-mail: [karnwal.bhavna980@gmail.com](mailto:karnwal.bhavna980@gmail.com)

### INTRODUCTION

Brain tumors are far more common than spinal cord tumors [1]. These Neoplasms represent a unique, heterogenous population of neoplasms and include both benign and malignant tumors. International data depict that tumors of central nervous system account for 1- 2% of all neoplasm [2].

In India, tumors of the CNS constitute about 1.9% of all tumors [3]. Males are involved more frequently, meningiomas being an exception with higher rates in females. Heritable syndromes and ionizing radiations are the only two established causes of primary CNS neoplasms. The annual incidence of tumour of CNS ranges from 10 -17 per 1,00,000 persons for intracranial tumours and 1-2per 1,00,000 persons for intra-spinal tumours. Majority of these are primary tumors [4].

Glial tumours are most common brain tumours. Their exact etiology and pathogenesis is unknown. Gliomas are further categorised into Astrocytomas, Ependymomas, Oligodendrogliomas and Glioblastoma multiforme [5].

The purpose of our study is to assess the histopathologic spectrum of glial tumors in our population. This will guide the clinicians to establish measures for an improved diagnosis and management protocols including the use of targeted chemotherapy for specific subtypes.

Furthermore, it will also open the door for more targeted research to determine the etiologic, molecular and genetic factors involved in the genesis of glial tumors which are common in our population.

**AIMS & OBJECTIVES**

1. To study age wise distribution of glial tumors in patients attending JAYAROGYA GROUP OF Hospital, Gwalior (Madhya Pradesh).
2. To study sex wise distribution of glial tumors in patients attending JAYAROGYA GROUP OF Hospital, Gwalior (Madhya Pradesh).
3. To study morphological spectrum of glial tumors and its distribution in patients attending JAYAROGYA GROUP OF Hospital, Gwalior (Madhya Pradesh).

**MATERIAL AND METHOD**

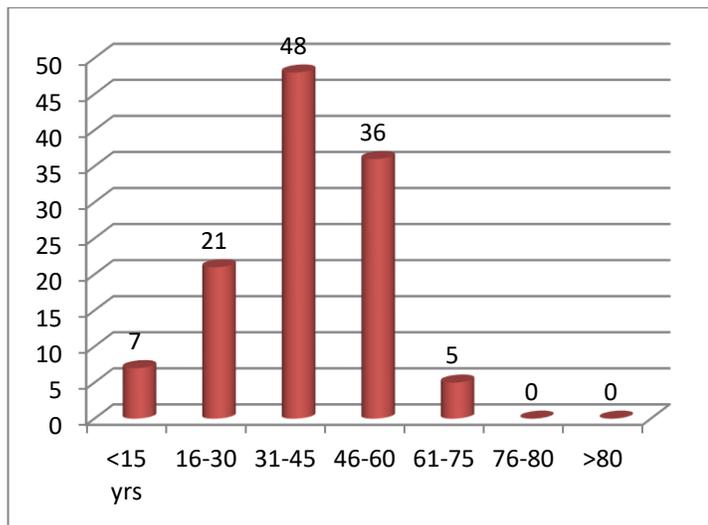
In this study we prospectively analyzed, 117 cases of glial tumors who underwent neurosurgery for space occupying lesions of the brain. Cases of non-glial tumors were excluded from the study. After gross examination routine histological sections were made using hematoxylin and eosin stains. The diagnosis and grading were done according to WHO classification of CNS tumors.

**RESULTS**

During our study, 117 cases of glial tumours were operated in department of neurosurgery for which biopsy sample was sent for histopathological examination. Out of these 117 cases of glial tumors cases which were analysed; 87 were Astrocytomas, 11 were Ependymoma, 12 were Glioblastoma multiforme and 7 were Oligodendroglioma.

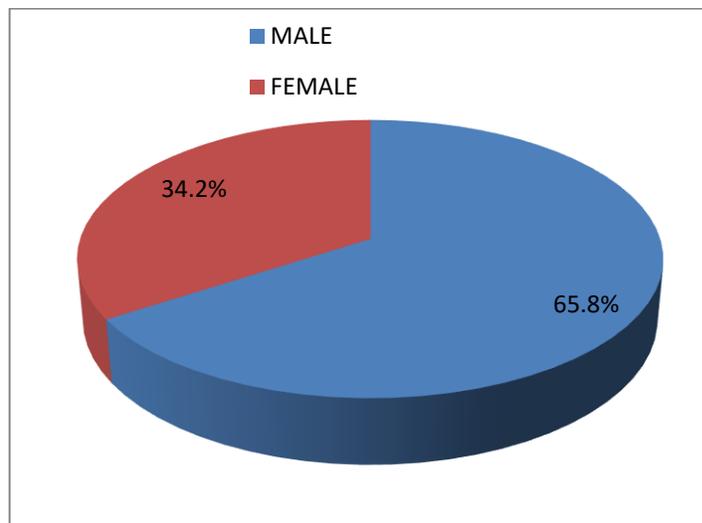
Most common age of presentation was 31 -45yrs age group (41%) followed by 46 -60yrs age group (30.7%). Only 5.9% of cases presented before 15yrs of age.

Males were affected more commonly with sex ratio of 1.9:1. Astrocytomas are the most common glial tumours in our population with grade II astrocytoma being most common followed by grade III tumours.



**Graph 1: Glial tumours Age-Wise distribution**

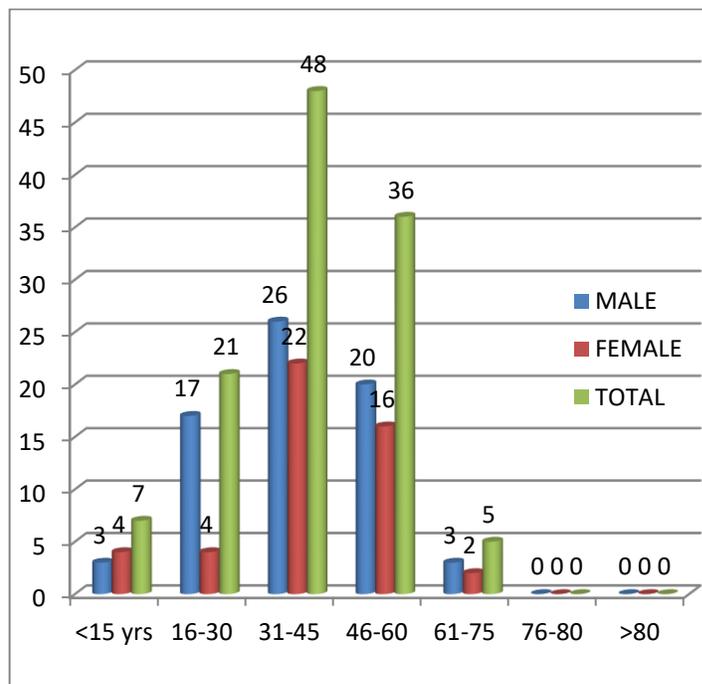
Graph 1 explains age wise distribution of glial tumours. Out of 117 cases -7 cases were less than 15 years, 21 cases were between 16- 30 years, 48 cases were between 31 -45 years, 36 cases were between 46-60 years, 5 cases age were between 61-75 years. No cases were found of the age more than 75years. Hence the most common age group of presentation of glial tumours was 31 – 45 years.



**Graph 2: Glial tumours sex wise distribution**

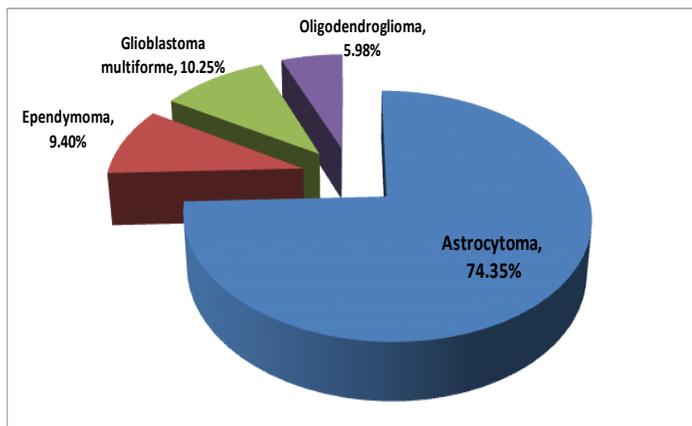
The above pie chart explains that out of total 117 operated cases for which biopsy sample was received for histopathological examination, 68.5% were males and 34.2% in females.

Sex ratio of glial tumors is (M: F) 1.9:1



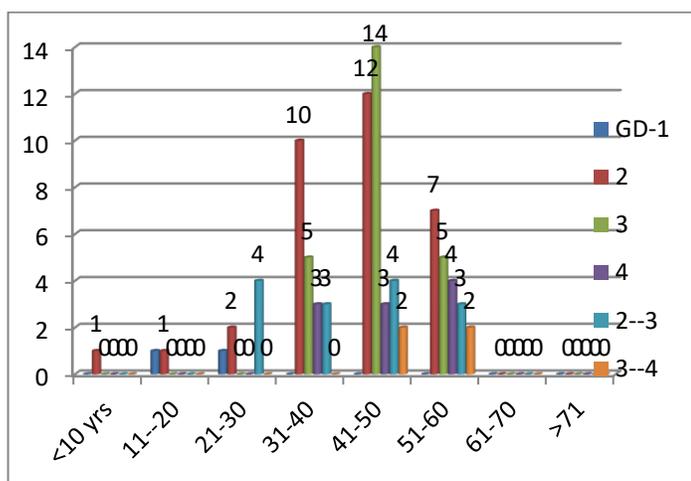
**Graph 3: Glial tumours age wise and sex wise distribution**

Graph 3 show that sex ratio is 1.9:1 and the most common age of presentation was between 31 -45 years of age group. The second highest age of presentation was 46-60yrs.



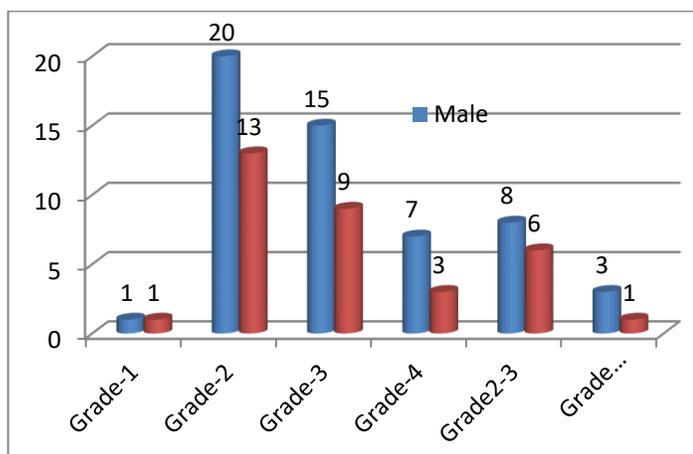
**Graph 4: Spectrum of glial tumours and its distribution**

The above pie chart shows morphologic spectrum of glial tumours. Out of total 117 cases 87 were astrocytomas (74.35%), Ependymoma were 11(9.40%), Glioblastoma multiforme were 12 (10.25%), oligodendroglioma were 7(5.98%).



**Graph 5: Astrocytoma tumours distribution age wise**

The above bar graph shows age wise distribution of Astrocytoma tumours -the most common age presentation was 41 -50 years of age.



**Graph 6: Astrocytomas tumours in sex distribution with grading**

The above bar graph shows sex distribution of astrocytomas tumours. Sex ratio is 1.6.

The most common grade is grade -2 and second most common is grade 3.

**DISCUSSION**

Present study comprised of detailed prospective histopathological study of 117 cases of glial tumours from February 2016 to July 2017. Out of 117 cases of glial tumors cases, 87 were Astrocytomas, 11 were Ependymoma, 12 were Glioblastoma multiforme and 7 were Oligodendroglioma.

Most common age of presentation was 31 -45yrs age group (41%) followed by 46 -60yrs age group (30.7%). Only 5.9% presented before 15yrs of age.

- Glial tumours Age wise distribution:** A study conducted by Jalali R *et al.*, in India in the year 2007 prospectively analyzed the incidence of CNS tumors in all age groups [6]. They found 580 cases of primary CNS neoplasms and 78 cases of metastatic tumors. According to their data primary brain tumors most commonly presented in middle age men as 36% of their patients presented between 19 to 40 years of age. According to Chawla *et al.*, [7] most common age group is 36 to 50 yrs. A study was conducted by Atif Ali Hashmi in Pakistan in 2012 with 126 glial tumor patients found the mean age to be 38.26 years ±17.24 (1-75 years) with most common presentation in middle age group between 18 and 50 years (64.3%) [5]. Study conducted by Ostrom et al found that the most common presentation is 15 -37 years of age group [8]. In our study, most common age of presentation was in 31 - 45 years age group (41%) followed by 46 -60 years age group (30.7%) whereas only 5.9% presented before 15 years of age. As compared to Jalali R *et al.*, and Chawla *et al.*, who studied CNS neoplasms, our study was done only in glial tumors.

Serial no.	Author	Year	Most common age group
1.	Jalali R <i>et al</i>	2007	19 – 40
2.	Ostrom <i>et al</i>	2012	15 – 37
3.	A A Hashmi <i>et al</i>	2014	18 – 50
4.	Present study	2017	31 – 45

- Glial tumours sex wise distribution:** Study by Robert Dubrow *et al.*, [9] found male /female incidence rate ratio between 1.4 and 1.5. Indian study by Chawla *et al.*, [7] 2012 found a sex ratio of 1.6:1 (male: female). Atif Ali Hashmi *et al.*, [5] found the sex ratio to be 2:1. In study by Saoussen Trabelsi [10] 2016, sex ratio was 1.5:1.

In our study sex ratio was 1.9:1 (male: female). The difference might be because we studied only glial tumours whereas some of above mentioned studies analysed all CNS tumours.

Serial no.	Author	Year	Sex ratio (male: female)
1.	Robert Dubrow <i>et al</i>	2011	1.4 – 1.5
2.	Chawla <i>et al</i>	2012	1.6
3.	Atifali Hashmi <i>et al</i>	2014	2.0
4.	Saoussen Trabelsi	2016	1.5
5.	Present study	2017	1.9

3. **Spectrum of glial tumours and its distribution:** Astrocytoma was the most common glial/neuroepithelial tumours in most of the studies (Table 4). In our study also, astrocytomas were the most common tumors (74.35%) amongst glial tumors. Manigreeva K *et al.*, analysed 231 cases of primary malignant brain tumours from north east India and in their study also astrocytoma was the most common (74.8%) types of neuroepithelial tumours. Z Ahmed *et al.*, [11] studied histological pattern of CNS neoplasms and in their subgroup of glial neoplasms; astrocytomas were most common tumours (71.37%) followed by oligodendrogliomas (15.06%). Narmadha R *et al.*, [12] also showed the most common tumours were astrocytic tumours followed by meningeal tumours in adults and embryonal tumours in children and adolescents.

In this present study there were total 87 cases of astrocytoma, median age of astrocytoma was 44years (mean 43.48 years), median age for males 43yrs while for females it was 45 yrs.

Serial no.	Author	Year	% of astrocytic tumours
1.	Manigreeva <i>et al</i>	2014	74.8%
2.	Z Ahmed <i>et al</i>	2001	71.37%
3.	Narmadha	2017	36.1% (of CNS tumours)
4.	Present study	2017	74.35%

## CONCLUSION

Most common presentation of glial tumors was in 31 -45yrs age group (41%) followed by 46 -60yrs age group (30.7%). Only 5.9% of cases presented before 15 years of age.

- Males were affected more commonly with sex ratio of 1.9:1.
- Morphological spectrum of glial tumors was analyzed among 117 enrolled cases; 87 were Astrocytomas, 11 were Ependymoma, 12 were glioblastoma multiforme and 7 were oligodendroglioma.

### How to cite this article:

Karnwal B, Sharma RL, Jain R and Jain B. Morphological Spectrum of Glial Tumors in J.A. Group of Hospitals, G.R. Medical College, Gwalior. *Int. J. Res. Dev. Pharm. L. Sci.* 2018; 7(3): 3011-3014. doi: 10.13040/IJRDP.L.2278-0238.7(3).3011-3014

This Journal is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

- Astrocytomas are the most common glial tumors in our population with grade II astrocytoma being most common followed by grade III tumors.

## REFERENCES

1. Central Brain Tumor Registry of the United States. Source for incidence and mortality data: Surveillance, Epidemiology, and End Results (SEER) Program and the National Center for Health Statistics. United States: National center for health statistics; Available from: <http://www.cbtrus.org/factsheet/factsheet.html>.
2. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. *CA Cancer J Clin.* 2005; 55:74–108.
3. Kanthikar SN, Nikumbh DB, Dravid NV. Histopathological overview of central nervous system tumors in North Maharashtra, India: a single center study. *Indian Journal of Pathology and Oncology*, January-March 2017;4(1):80.
4. Dasgupta A, Gupta T, Jalali R. Indian data on central nervous tumors: A summary of published work. *South Asian J Cancer.* 2016; 5:147-53.
5. Hashmi AA, Faridi N, Malik B, Edhi MM, Khurshid A, Khan M. Morphologic spectrum of glial tumors: an increased trend towards oligodendroglial tumors in Pakistan. *Int Arch Med.* 2014; 7: 33.
6. Jalali R, Datta D: Prospective analysis of incidence of central nervous system tumors presenting in a tertiary cancer hospital from India. *J Neurooncol* 2008; 87: 111–4.
7. Chawla N, Kataria SP, Malik S, Sharma N, Kumar S. Histopathological spectrum of cns tumours in a tertiary care referral centre – a one-year study. *Int J App Basic Med Res.* May-Aug 2014; 4: 141-5.
8. Quinn T, Ostrom, Luc Bauchet, Faith G. Davisret. The epidemiology of glioma in adults: a “state of the science” review. *Neuro-Oncology.* 2015;17(4): 623–4.
9. Dubrow R, Darefsky AS: demographic variation in incidence of adult glioma by subtype, United States, 1992-2007. *BMC Cancer.* 2011; 11:325.
10. Trabelsi S, Brahim DH, Ladib M, *et al.* Glioma epidemiology in the central Tunisian population: 1993-2012. *Asian Pac J Cancer Prev.* 2014;15(20):8753-7.
11. Ahmed Z, Azad NS, Muzaffer S, Hasan SH. CNS tumors at AKU: an update plus a brief discussion on intraventricular tumors with special emphasis on central neurocytoma. *J Ayub Med Coll Abbott.* 2004;16(4):12–5.
12. Narmada R, Dhanalakshmi SP, Priyadharshni M *et al.* Histomorphological study of CNS tumours – a 3-year retrospective descriptive study in a tertiary care center. *J Evolution med. Dent. Sci* 2017;6(43); 3362 -6.