ORIGINAL RESEARCH PAPER

Pathology

HIGH GRADE GLIOMA: A CLINICO-PATHOLOGICAL STUDY

KEY WORDS: High Grade glioma

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ABSTRACT

High-grade glioma is the most frequent primary brain tumor in adults. Glioblastoma can be classified in to primary type and secondary type. High-grade glioma can occur at any age, the average age of onset for Glioblastoma is 62 year. Symptoms or signs of brain tumors are produced by the tumor mass, the adjacent edema, or the infiltration and destruction of normal tissue. MRI brain is standard investigation for diagnosis. Management of high-grade glioma includes medical management and surgical, in form of biopsy or cytoreduction for confirmation of diagnosis and adjuvant therapy.

INTRODUCTION

CNS tumor is the primary concern of neurosurgeon as well as neurosurgical patients, accounting for approximately 20% of all childhood malignancies and 10% of cases in young adults. Brain tumors are the second most common malignancies and the most common solid tumor seen during childhood. High-grade glioma is the most frequent primary brain tumor in adults, and account for most of primary brain tumor cases diagnosed each year. Based on standard histopathology grading and as per revised WHO classification of CNS tumours 2016, more than 40 % of CNS tumors are WHO IV-High grade glioma is one of the most devastating human cancers because of its rapid growing nature[1].
Glioblastoma can be classified in to primary type and secondary type. Although these two types develop through mutations of different genetic pathways both behave in a clinically indistinguishable manner and the survival rates are also similar[1, 2]. This reviews highlights the clinical and histological features at presentation and management strategy.

MATERIAL AND METHOD:

The present study was retrospective study, based on data retrospectively collected from department of Neurosurgery from 2015 to 2018. All histopathological confirmed cases of high-grade glioma (Glioblastoma multiforme &its variants) were studied. Patient not willing for study or those who previously operated for glioma and presented with recurrence are excluded from the study. Preoperative data regarding neurological status, age, gender, clinical features, radiological features, extend of resection, adjuvant therapy and clinical outcome were consider for review. Tumor removal was considered complete/ gross total if surgeon convinced that there had been complete removal and if postoperative contrast –enhances CT imaging showed no evidence of residual tumor. Removal was considered subtotal or near if residual tumor is more or less than 10% on postoperative contrast enhances CT.

Histologically high-grade glioma constitutes WHO grade III and grade IV tumors. Grade III display mitotic activity and nuclear atypia. WHO grade IV tumors show nuclear atypia, mitoses, and endothelial proliferation or necrosis constitutes Glioblastoma multiforme and Gliosarcoma. Gliosarcoma is variants of Glioblastoma multiforme, which contains a prominent sarcomatous element.

RESULT

The study was conducted on 45 high-grade glioma cases. There were 28 (62.22%) male and (37.77%) females. Male to female ratio were 1.8:1. Most common age group was between 41-50 (followed by 51-60 years. The mean age of patients was 32 years (table 1).

Group	Number	Percentage
1-10	0	0
11-20	7	15.55%
21-30	4	8.8%
31-40	12	26.66%
41-50	16	35.55%
51-60	3	6.6%
61-70	2	4.44%
>	1	2.22%
Total	45	100

In the present study of 45 cases of high-grade glioma –tumor incidence in single lobe was 64.44% of which in frontal lobe is 28%, temporal lobe 17.77%, parietal lobe 13.33%, occipital lobe 4.44% and in multiple lobe it was 35.55% (Table 2).

Table 2: Location wise distribution of High-grade glioma

Location	Number	Percentage
Frontal	13	28.88
Temporal	8	17.77
Parietal	6	13.33
Occipital	2	4.44
Fronto-parietal	8	17.77
Fronto-temporal	3	6.66
Temporo-parietal	2	4.44
Parieto-occipital	1	2.22
Multiple > 2 lobes	1	2.22
Deep limbic system, thalamus,	1	2.22
Total	45	100

In the present series headache was most common complaint in 33(73.33) cases followed by neurological deficit in 18(40%), vomiting 16(35.55) as mentioned below in table 3.

Table 3: Presenting complaints in High-grade glioma

Clinical Presentation	Number	Percentage
Headache	33	73.33
Neurological deficit, hemiparesis	18	40
Vomiting	16	35.55
Seizure	7	15.55
Altered consciousness	6	13.33
Behavioral changes	5	11.11
Visual disturbances	2	4.44

In the present series of high-grade glioma 68.88% under went gross total excision and 24.44% underwent near total while only 6.66 % underwent biopsy or subtotal excision of tumor that were defined on the basis of post operative contrast CT.

Table 4: Extent of surgical removal of high-grade glioma

Extent of resection	Number	Percentage
Gross total	31	68.88
Near total	11	24.44
Subtotal/ Biopsy	3	6.66

In the present series Glioblastoma multiforme was the most common type of high-grade glioma, present in 35(77.77%)

followed by anaplastic glioma in 17.77% and Gliosarcoma in 4.44% as mentioned below in table 5.

Table 5: Histological type of high grade glioma

Histological type	Number	Percentage
Glioblastoma multiforme	35	77.77
Anaplastic glioma	8	17.77
Gliosarcoma	2	4.44

DISCUSSION

High-grade glioma is the most common primary central nervous neoplasms. They also continue to be among the top ten causes of cancer related deaths despite a relatively low incidence when compared with other cancers. The incidence rate of primary malignant brain tumor is 6.4 cases/ 100,000-person/ year. The global incidence rate of primary malignant brain tumor is 3.6/100000 person-year in males and 2.5/100000 person –year [3,4,5].

Where as a malignant glioma can occur at any age, the average age of onset for Glioblastoma is 62 year. In general, glioma affects males more frequently than females suggesting a possible protective effect provided by female hormones, through such a protective effect is merely speculation [3,4,5]. The study revealed male were more commonly involve than female, 28 (62.22%) male and (37.77%) females. Male to female ratio were 1.8:1. Most common age group was between 41-50 (followed by 51-60 years).

Symptoms or signs of brain tumors are produced by the tumor mass, the adjacent edema, or the infiltration and destruction of normal tissue. However these symptoms and signs and are best appreciated by considering the tumor location and growth rate. High-grade glioma can cause either generalized of focal neurological dysfunction. Generalized group include features of raised intracranial pressure while focal groups include recurrent seizure and focal neurological deficit [6,7,8]. In the present series headache was most common complaint in 33(73.33) cases followed by neurological deficit in 18(40%), vomiting 16(35.55). Roth et al reported most common symptoms were headache (74%) followed by limb weakness (42%), difficulty in speech (28%), decreased vision (27%).

Magnetic resonance is clearly the accepted imaging standard for the pre operative diagnosis and follows up. MRI demonstrates an infiltrative, intra axial, soft tissue mass within the cerebral hemispheres that is heterogeneous in signal intensity on all sequences.

Management of high-grade glioma includes medical management for seizure prophylaxis, steroids for peritumoral edema and surgical management. The principal surgical procedures for malignant glioma are biopsy or cytoreduction for histological confirmation and to relief pressure symptoms [9,10]. Recently some studies show near total or complete excision improves survival. In the present series of high-grade glioma 68.88% under went gross total excision and 24.44% underwent near total while only 6.66 % underwent biopsy or subtotal excision of tumor that were defined on the basis of post operative contrast CT.

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