Determinants of poor prognosis after surgery for glioblastoma: A retrospective analysis of predictors of morbidity and mortality in a low-middle-income country

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INTRODUCTION

- High-grade gliomas (HGG) are the most prevalent types of primary brain tumors.
- Grade-I tumors have a low growth rate and can often be treated surgically. In contrast, Grade-II to Grade-IV gliomas are highly aggressive and malignant.
- Despite aggressive treatment, recurrence is almost inevitable, with a significantly poor prognosis.

OBJECTIVE

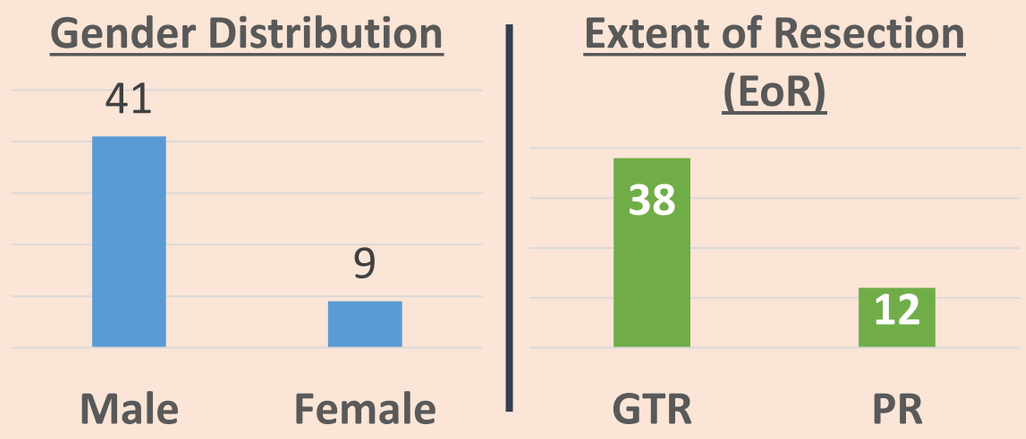
- To determine the factors associated with morbidity and mortality in patients with glioblastoma after surgical excision

METHODOLOGY

- Retrospective observational study.
- Glioblastoma multiforme tumor excision surgery at the Punjab Institute of Neurosciences between 2022 and 2024.
- Multiple predictor variables were identified using univariate and multivariate analysis.
- The relationship between overall survival and predictor variables was presented in the form of Kaplan-Meier survival curves.

RESULTS

- Mean Age **47.0±15.8** years



- Mean KPS **Pre-op 65.**2±17.6 vs **post-op 52.4**±26.1.
- The median **OS was 381.5 days**.

RESULTS

- **Obesity, tumor origin, pre-op** and **post-op GCS** and **KPS** score, and **EoR** were identified as significant predictor variables using univariate analysis ($p<0.05$).

Principal Component Analysis

Variables	Comp 1	Comp 2	Comp 3
Obesity	-0.171	-0.685	-0.089
Tumor Origin	-0.118	0.045	0.938
Pre-op GCS	0.645	0.542	-0.196
Post-op GCS	0.425	0.691	0.285
Pre-op KPS	0.842	0.025	-0.132
Post-op KPS	0.771	0.184	0.080
EoR	0.115	-0.739	0.475

- On multivariate analysis, **EoR** was a significant positive predictor of survival, HR=0.041 (95% CI: [0.003-0.581]).

Multivariate Analysis using Cox regression model

Predictors	HR	95% CI	p-value
Tumor Origin Category 1 Category 2	0.449 0.314	0.024-8.211 0.023-4.202	0.589 0.381
Pre-op KPS Category 1 Category 2	0.442 0.246	0.032-6.185 0.018-3.320	0.545 0.291
EoR	0.041	0.03-0.581	<0.05*

DISCUSSION

- Brown et al. reported younger age as a significant independent positive prognostic factor for GBM. Females with GBM are shown to have an improved OS.
- Cappelli et al. reported normal BMI (19-24.99) is associated with good OS and PFS in GB patients. This might be attributed to the fact that obesity leads to insulin resistance and raised IGF-1 levels which inhibits apoptosis.
- Skardley et al. reported a decrease OS by 0.88 with each 10cm3 residual tumor volume after surgical resection in glioblastoma, yet the variability in grading of EoR is still a cause of controversy

CONCLUSION

Majority of gliomas undergo gross total resection and had a median survival of one year. EoR is a significant independent predictor of survival in glioblastomas, where gross total resection is associated with a lower risk of mortality.

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