**Impact of molecular marker and treatment on overall survival and progression free survival in patients with recurrent GBM: A retrospective single center analysis**

**Background:** GBM is the most common aggressive CNS tumor in adults with poor prognosis. Recurrence of the GBM is inevitable with a median survival of 12-15 months. We have no standard of care treatment for recurrent GBM and lot of clinical trial has been going on to for the recurrent GBM. We report the association of the molecular marker and type of treatment on overall survival and progression free survival in recurrent GBM.

**Methods:** After IRB approval, we reviewed the chart of 288 recurrent GBM patients from 2012 to till date. Multivariable analysis was used to calculate the overall and progression free survival for the 3 cohort of patients (EGFR, MGMT, IDH mutation).

**Results:** 43% of the patient had EGFR amplification, 38% harbored MGMT mutation and 7.4% were IDH- 1 mutation, only 4 patient had TERT mutation therefore they were not included for analysis. 66 (25.6%) patients had surgery, 29 (11.2%) had radiation, 184(72.4%) had chemotherapy. Out of these patients who had chemotherapy, 34 had Lomustine alone, 81 had Bev alone and 18 had both, 81(31.4%) patients were on clinical trials. Mean duration between first surgical diagnosis to 1st recurrence for all patient is 9.4 months; The median overall survival was 11.7 months; the median PFS from the diagnosis to the first recurrence is 6.49 months; and the median PFS from the first recurrence to the second recurrence is 4.59 months. The median PFS for MGMT methylation and non methylation was 9.05 and 5.51 months, Hazard ratio of 0.59 (0.43, 0.080), p-value (<0.001). There were no association of molecular marker on the overall survival on all 3 cohort of the patient. On further analysis, treatment with bevacizumab is associated with either lower risk of recurrence and PFS in all 3 cohort of patients.

**Diagnosis to first recurrence and molecular status**

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| --- | --- | --- | --- | --- | --- |
|  | N | No. Event | Estimated Median | HR ( 95%CI ) | P-value |
| EGFR |  |  |  |  |  |
| -non-amplification | 126 | 124 | 7.44 | Reference |  |
| -amplification | 95 | 95 | 6.72 | 1.17 ( 0.89 , 1.54 ) | 0.27 |
| MGMT |  |  |  |  |  |
| -non methylation | 120 | 118 | 5.51 | Reference |  |
| -methylation | 73 | 72 | 9.05 | 0.59 ( 0.43 , 0.80 ) | < 0.001 |
| IDH-1 |  |  |  |  |  |
| -wild | 188 | 185 | 6.39 | Reference |  |
| -mutation | 15 | 15 | 8.33 | 1.13 ( 0.67 , 1.92 ) | 0.65 |

**Conclusion:** Molecular marker have impact on the progression free survival esp. MGMT methylation but no association with overall survival. Bevicizumab is efficacious in recurrent GBM but we need standard of care for recurrent GBM for increased overall survival benefit.