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Clinical and molecular features of patients with IDH1 wild-type primary glioblastoma presenting unexpected short-term survival after gross total resection

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Abstract

Background: This study investigated the factors influencing short-term survivors (STS) after gross total resection (GTR) in patients with IDH1 wild-type primary glioblastoma.

Methods: We analyzed five independent cohorts who underwent GTR, including 83 patients from Kitasato University (K-cohort), and four validation cohorts of 148 patients from co-investigators (V-cohort), 66 patients from the Kansai Molecular Diagnosis Network for the Central Nervous System tumors, 109 patients from the Cancer Genome Atlas, and 40 patients from the Glioma Longitudinal AnalySiS. The study defined STS as those who had an overall survival \leq 12 months after GTR with subsequent radiation therapy, and concurrent and adjuvant temozolomide (TMZ).

Results: The study included 446 patients with glioblastoma. All cohorts experienced unexpected STS after GTR, with a range of 15.0-23.9% of the cases. Molecular profiling revealed no significant difference in major genetic alterations between the STS and non-STS groups, including MGMT, TERT, EGFR, PTEN, and CDKN2A. Clinically, the STS group had a higher incidence of non-local recurrence early in their treatment course, with 60.0% of non-local recurrence in the K-cohort and 43.5% in the V-cohort.

Conclusions: The study revealed that unexpected STS after GTR in patients with glioblastoma is not uncommon and such tumors tend to present early non-local recurrence. Interestingly, we did not find any significant genetic alterations in the STS group, indicating that such major alterations are characteristics of GB rather than being reliable predictors for recurrence patterns or development of unexpected STS.

Keywords: Extent of resection; Glioblastoma; Gross total removal; Recurrence pattern; Short-term survivors.

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