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Long-term survivors in 976 supratentorial glioblastoma, IDH-wildtype patients

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Abstract

Objective: Glioblastoma, isocitrate dehydrogenase (IDH)-wildtype is the most aggressive glioma with poor outcomes. The authors explored survival rates and factors associated with long-term survival in patients harboring a glioblastoma, IDH-wildtype.

Methods: In an observational, retrospective, single-center study, the authors examined the medical records of 976 adults newly diagnosed with supratentorial glioblastomas, IDH-wildtype between January 2000 and January 2021. They analyzed clinical-, imaging-, and treatment-related factors associated with 2-year and 5-year survival.

Results: The median overall survival was 11.2 months (12.2 months for patients included after 2005 and the introduction of standard combined chemoradiotherapy). The median progression-free survival was 9.4 months (10.0 months for patients included after 2005). Overall, 17.6% of patients reached a 2-year overall survival, while 2.2% of patients reached a 5-year overall survival. Furthermore, 6.6% of patients survived 2 years without progression, while 1.1% of patients survived 5 years without progression. Two factors that were consistently associated with 2-year and 5-year survival were first-line oncological treatment with standard combined chemoradiotherapy and methylated O6-methylguanine-DNA methyltransferase promoter. Other factors that were significantly associated with 2-year or 5-year survival were age at diagnosis ≤ 60 years, headaches or signs of raised intracranial pressure at diagnosis, cortical contact of contrast enhancement, no contrast enhancement crossing the midline on initial imaging, total or subtotal tumor resection, and a second line of oncological treatment at recurrence. Within 21 cases of 5-year survival, 18 were confirmed to be glioblastomas, IDH-wildtype, and 7 of the 5-year survivors (38.9%) had additional genetic alterations: 3 cases had an FGFR mutation or fusion, 3 cases had a PIK3CA mutation, 1 case had a PTPN11 mutation, and 1 case had a PMS2 mutation in the context of constitutional mismatch repair deficiency syndrome.

Conclusions: Five-year overall survival in patients with glioblastoma, IDH-wildtype is extremely low. Predictors of a longer survival are mostly treatment factors, emphasizing the importance of a complete oncological treatment plan, when achievable. Glioblastoma, IDH-wildtype 5-year survivors could be screened for actionable targets in case of recurrence.

Keywords: glioblastoma; isocitrate dehydrogenase; oncology; overall survival; surgery; survival analysis; tumor.