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Hypofractionated radiotherapy for glioblastoma: A large institutional retrospective assessment of 2 approaches

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Abstract

Background: Glioblastoma (GBM) poses therapeutic challenges due to its aggressive nature, particularly for patients with poor functional status and/or advanced disease. Hypofractionated radiotherapy (RT) regimens have demonstrated comparable disease outcomes for this population while allowing treatment to be completed more quickly. Here, we report our institutional outcomes of patients treated with 2 hypofractionated RT regimens: 40 Gy/15fx (3w-RT) and 50 Gy/20fx (4w-RT).

Methods: A single-institution retrospective analysis was conducted of 127 GBM patients who underwent 3w-RT or 4w-RT. Patient characteristics, treatment regimens, and outcomes were analyzed. Univariate and multivariable Cox regression models were used to estimate progression-free survival (PFS) and overall survival (OS). The impact of chemotherapy and RT schedule was explored through subgroup analyses.

Results: Median OS for the entire cohort was 7.7 months. There were no significant differences in PFS or OS between 3w-RT and 4w-RT groups overall. Receipt and timing of temozolomide (TMZ) emerged as the variable most strongly associated with survival, with patients receiving adjuvant-only or concurrent and adjuvant TMZ having significantly improved PFS and OS ($P < .001$). In a subgroup analysis of patients that did not receive TMZ, patients in the 4w-RT group demonstrated a trend toward improved OS as compared to the 3w-RT group ($P = .12$).

Conclusions: This study demonstrates comparable survival outcomes between 3w-RT and 4w-RT regimens in GBM patients. Receipt and timing of TMZ were strongly associated with survival outcomes. The potential benefit of dose-escalated hypofractionation for patients not receiving chemotherapy warrants further investigation and emphasizes the importance of personalized treatment approaches.

Keywords: dose escalation; elderly; frail; glioblastoma multiforme; hypofractionated radiotherapy.