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Outcomes and treatment algorithm in glioblastoma patients 80 years and older

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Abstract

Background and objectives: The current standard of care for patients with glioblastoma (GBM) is maximal safe resection followed by adjuvant radiation therapy with concurrent temozolomide chemotherapy. Previous studies that identified this treatment regimen focused on younger patients with GBM. The proportion of patients with GBM over the age of 80 is increasing. We investigate whether elderly patients benefit from the current standard of care with additional maximal safe resection.

Methods: Clinical, operative, radiographic, demographic, genetic, and outcomes data were retrospectively collected for patients treated for histologically confirmed WHO grade 4 GBM at UPMC from 2009 to 2020. Only patients 80-years and older were included (n=123). Statistically significant values were set at $p < 0.05$.

Results: A univariate Cox proportional hazards analysis of GBM patients >80 years old identified the use of temozolomide, radiation, Karnofsky Performance Status (KPS) >70, and MGMT methylation with increased overall survival (OS). Further multivariate Cox proportional hazards model analysis showed that the variables identified in the univariate analysis passed multicollinearity testing, and that use of temozolomide, KPS >70, and gross total resection were shown to significantly impact survival. Survival analysis showed that patients with biopsy alone had a shorter median OS compared to patients who received resection, temozolomide, and radiation ($p < 0.0001$, median OS 1.6 vs. 7.5 months). Additionally, patients who underwent biopsy and then received temozolomide and radiation had a shorter median OS when compared to patients who received resection, temozolomide, and radiation ($p = 0.0047$, median OS 3.6 vs. 7.5 months).

Conclusion: For elderly patients with KPS >70, GTR followed by radiation and temozolomide is associated with maximum OS.

Keywords: Elderly Patients; GBM; Glioblastoma multiforme; neurosurgery; survival rate.

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