Nomograms for predicting survival of elderly patients with newly diagnosed glioblastoma: a secondary analysis of the CCTG CE.6 trial

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Fabio Y. Moraes, Jonah Isen, James Perry, Norm Laperriere, Alba Brandes, Johan Menten, Claire Phillips, Mike Fay, Ryo Nishikawa, Warren P. Mason, J. Greg Cairncross, Wilson Roa, Keyue Ding & Chris O'Callaghan

Abstract

Background

Glioblastoma (GB) in the elderly is associated with poor prognosis and outcome heterogeneity. We aimed to develop and validate prognostic nomograms for elderly GB patients using data from the CCTG CE.6 trial.

Methods

Data from 562 patients (≥65 years) randomized to radiotherapy alone (RT) or radiotherapy plus temozolomide (RT + TMZ) were divided into training and testing cohorts (3:2 ratio). Cox regression identified prognostic factors associated with overall survival (OS), which were integrated into multivariable models. Nomograms were constructed, internally validated, and used to stratify patients into risk groups. Kaplan–Meier survival estimates and log-rank tests assessed model performance.

Results

In the RT + TMZ cohort, low MMSE, biopsy-only resection, male sex, and MGMT status unknown were independently associated with poorer OS. Median OS in training data was 5.7, 10.9, and 13.8

months for high-, middle-, and low-risk groups, respectively, with comparable results in validation (6.6, 9.9, and 13.1 months). PFS stratification also showed significant differences (median 3.3, 6.0, and 7.6 months). For the RT-alone arm, biopsy-only resection and male sex were prognostic, with risk groups demonstrating significant OS and PFS differences.

Conclusions

Trial-based nomograms were developed and validated for elderly GB patients, effectively stratifying risk and predicting survival. These tools may guide individualized prognostication, inform treatment decisions, and improve trial design in this underrepresented population.

Key points

- Trial-based nomograms predict survival in elderly glioblastoma patients.
- MMSE, resection extent, sex, and MGMT status guide prognostic stratification.
- Models stratify patients into distinct risk groups for OS and PFS prediction.