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## Prognostic nomogram for glioblastoma (GBM) patients presenting with distant extension: a seerbased study

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## Abstract

**Background:** Glioblastoma (GBM) with distant extension is rarely reported. We retrieved the data of GBM patients from the SEER database to identify the prognostic factors of GBM with distant extension and constructed a nomogram to predict the overall survival (OS) of these patients.

**Methods:** The data of GBM patients between 2003 and 2018 were retrieved from the SEER Database. 181 GBM patients with distant extension were randomly divided into the training cohort (n = 129) and the validation cohort (n = 52) at a ratio of 7:3. The prognostic factors associated with the OS of the GBM patients were identified through univariate and multivariate cox analyses. A nomogram was constructed based on the training cohort to predict OS, and its clinical value was verified using the validation cohort data.

**Results:** Kaplan-Meier curves showed that the prognosis was significantly worse for GBM patients with distant extension than GBM patients without distant extension. Stage (GBM patients with distant extension) was independent prognostic factor of survival. Multivariate Cox analyses demonstrated that age, surgery, radiotherapy and chemotherapy were independent risk factors for OS of GBM patients presenting with distant extension. The C-indexes of the nomogram for predicting OS were 0.755 (95% CI 0.713-0.797) and 0.757 (95% CI 0.703-0.811) for the training and validation cohorts, respectively. The calibration curves of both cohorts showed good consistency. The area under the curve (AUC) for predicting 0.25-year, 0.5-year and 1-year OS in the training cohort were 0.793, 0.864 and 0.867, respectively, and that in the validation cohort were 0.845, 0.828 and 0.803, respectively. The decision curve analysis (DCA) curves showed that the model to predict the 0.25-year, 0.5-year and 1-year OS probabilities was good.

**Conclusion:** Stage (GBM patients with distant extension) is independent prognostic factor for GBM patients. Age, surgery, radiotherapy and chemotherapy are independent prognostic factors for GBM patients presenting with distant extension, and the nomogram based on these factors can accurately predict the 0.25-year, 0.5-year and 1-year OS of these patients.

Keywords: Glioblastoma; Neoplasm metastasis; Nomogram; Overall survival; Prognosis.

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