Survival in patients with newly diagnosed conventional glioblastoma: a modified prognostic score based on a single-institution series

Federica Bertolini1, Elena Zunarelli2, Caterina Baraldi1, Antonella Valentini3, Cinzia Del Giovane1, Roberta Depenni1, Angelo Falasca3, Patrizia Giacobazzi4, Marcella Malagoli5, Stefano Meletti6, Annalisa Fontana1, and PierFranco Conte1 on behalf of the Gruppo Neuro Oncologico Modena (GNO-MO)

1Division of Oncology, and 2Division of Pathology, University Hospital, Modena; 3Division of Neurosurgery, Nuovo Ospedale Civile S Agostino-Estense, Modena; 4Division of Radiotherapy, University Hospital, Modena; 5Division of Neuroradiology, and 6Division of Neurology, Nuovo Ospedale Civile S Agostino-Estense, Modena, Italy

ABSTRACT

Aims and background. Recursive partitioning analysis (RPA) is commonly used to define the stratification of patients with glioblastoma. Epigenetic silencing of the O6-methylguanine methyltransferase (MGMT) gene by promoter methylation plays an important role in regulating MGMT expression in gliomas and this is an established independent prognostic factor. We tested a prognostic scoring system including all clinical variables used by RPA classification (age, ECOG performance status and type of surgery) and MGMT gene promoter methylation status.

Methods. Seventy-eight consecutive patients with newly diagnosed, histopathologically confirmed conventional glioblastoma were included. Information about MGMT promoter methylation status was available for all of them. Based on the patients’ age (≤50 vs ≥50 years), ECOG performance status (0 vs 1), type of surgery (gross tumor resection versus partial resection/biopsy) and MGMT promoter methylation status (methylated versus unmethylated), three classes of risk were generated where the prognostic score was defined assigning 1 point to every favorable parameter (Class I: ≥3; Class II: 2; Class III: 0-1). All classes were correlated with overall survival.

Results. The median survival times were 32.4, 8.6 and 8.8 months for Class I, II and III, respectively, corresponding to 2-year survival rates of 69%, 13.5% and <1%. The same analysis was performed on 54 patients treated with postoperative concomitant chemoradiotherapy. The median survival times were 32.5, 13.4 and 8.9 months for Class I, II and III, respectively, corresponding to 2-year survival rates of 68.6%, 26.9% and <1%. In both groups of 78 and 54 patients the differences in survival between Class I and III were statistically significant (P<0.0001).

Conclusions. The proposed prognostic scoring system including clinical variables and MGMT promoter methylation status proved valuable in patients with primary conventional glioblastoma, especially those treated with postoperative chemoradiotherapy.

Key words: glioblastoma, MGMT, prognostic score, clinical variables, molecular variables.

Correspondence to: Federica Bertolini, Division of Oncology, University Hospital, Via del Pozzo 71, 41100 Modena, Italy
Tel +39-059-4223252;
fax +39-059-4224429;
email bertolini.federica@policlinico.mo.it

Received January 25, 2012; accepted June 21, 2012