Abstract

Background.

The current method for assessing progressive disease (PD) in glioblastoma is according to the Response Assessment in Neuro-Oncology (RANO) criteria. Bevacizumab-treated patients may show pseudo-response on postcontrast T1-weighted (T1w) MRI, and a more infiltrative non-enhancing growth pattern on T2w/FLAIR images. We investigated whether the RANO criteria remain the method of choice for assessing bevacizumab-treated recurrent glioblastoma when compared with various volumetric methods.

Methods.

Patients with assessable MRI data from the BELOB trial (n = 148) were included. Patients were treated with bevacizumab, lomustine, or both. At first and second radiological follow-up (6 and 12 wk), PD was determined using the 2D RANO criteria and various volumetric methods based on enhancing tumor only and enhancing plus non-enhancing tumor. Differences in overall survival (OS) between PD and non-PD patients were assessed with the log-rank test and a Cox model. Hazard ratios (HRs) and their 95% CIs were determined.
For all patients together, all methods (except subtraction of non-enhancing from enhancing volume at first follow-up) showed significant differences in OS between PD and non-PD patients ($P < .001$). The largest risk increase for death in case of PD at both first and second follow-up was found with the RANO criteria: HR = 2.81 (95% CI, 1.92–4.10) and HR = 2.80 (95% CI, 1.75–4.49), respectively. In the bevacizumab-treated patients, all methods assessed showed significant differences in OS between PD and non-PD patients. There were no significant differences between methods.

Conclusions.

In the first 12 weeks, volumetric methods did not provide significant improvement over the RANO criteria as a posttreatment prognostic marker.

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