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Proton MR spectroscopy provides relevant prognostic information in high-grade astrocytomas.

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Abstract

BACKGROUND AND PURPOSE: There is a large range of survival times in patients with HGA that can only be partially explained by histologic grade and clinical aspects. This study aims to retrospectively assess the predictive value of single-voxel (1)H-MRS regarding survival in HGA.

MATERIALS AND METHODS: Pretreatment (1)H-MRS in 187 patients with HGA produced 180 spectra at STE (30 ms) and 182 at LTE (136 ms). Patients were dichotomized into 2 groups according to survival better or worse than the median. The spectra of the 2 groups were compared using the Mann-Whitney U test. The points on the spectrum with the most significant differences were selected for discriminating patients with good and poor prognosis. Thresholds were defined with ROC curves, and survival was analyzed by using the Kaplan-Meier method and the Cox proportional hazards model.

RESULTS: Four points on the spectrum showed the most significant differences: 0.98 and 3.67 ppm at STE; and 0.98 and 1.25 ppm at LTE (P between <.001 and .011). These points were useful for stratifying 2 prognostic groups (P between <.001 and .003, Kaplan-Meier). The Cox forward stepwise model selected 3 spectroscopic variables: the intensity values of the points 3.67 ppm at STE (hazard ratio, 2.132; 95% CI, 1.504-3.023), 0.98 ppm at LTE (hazard ratio, 0.499; 95% CI, 0.339-0.736), and 1.25 ppm at LTE (hazard ratio, 0.574; 95% CI, 0.368-0.897).

CONCLUSIONS: (1)H-MRS is of value in predicting the length of survival in patients with HGA and could be used to stratify prognostic groups.

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