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Abstract

OBJECTIVE: To investigate the usefulness of diffusion-weighted imaging (DWI)-guided, single-voxel proton magnetic resonance spectroscopy (SVS) for preoperative evaluation of cerebral glioma grade.

METHODS: For SVS, placement of volume-of-interest was guided by the minimal apparent diffusion coefficient value obtained from DWI. Spectral data for N-acetylaspartate (NAA), choline (Cho), and phosphocreatine (Cr) were analysed in 33 patients with primary gliomas.

RESULTS: Cho/Cr and Cho/NAA ratios were significantly higher in high-grade than in low-grade gliomas; NAA/Cr ratios were significantly lower in high-grade than in low-grade gliomas. Receiver operating characteristic curve analysis demonstrated a threshold value of 2.01 for Cho/Cr for sensitivity, specificity, positive predictive and negative predictive values of 86.36%, 90.00%, 95.00% and 75.00%, respectively. Threshold values of 2.49 and 0.97 were obtained for Cho/NAA and NAA/Cr, respectively. Despite no significant difference in diagnostic accuracy between the metabolite ratios, diagnostic accuracy using the Cho/Cr ratio was slightly better than that of Cho/NAA or NAA/Cr.

CONCLUSION: DWI-guided SVS has potential value for the preoperative prediction of glioma grade.

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