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### **Proton magnetic resonance spectroscopy predicts survival in children with diffuse intrinsic pontine glioma.**

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#### **Abstract**

Patients with diffuse intrinsic pontine glioma (DIPG) face a grim prognosis with limited treatment options. Many patients will enroll on investigational trials though the role of chemotherapy or immunotherapy is unclear. Radiographic changes on conventional MRI are used to evaluate tumor response and progression, but are not predictive of outcome in these patients. More sensitive measures of tumor biology are needed to improve patient management. We evaluated changes in magnetic resonance spectroscopy (MRS) biomarkers in patients with DIPG. Thirty-eight patients were enrolled prospectively on an IRB-approved protocol, which included standard MRI, single voxel spectroscopy (SVS) and multi-slice multi-voxel spectroscopy (MRSI). Scans were performed at multiple time points during each patient's clinical course, with a total of 142 scans. The prognostic values of Choline:N-acetylaspartate (Cho:NAA), Cho:Creatine (Cho:Cr) and the presence of lactate and lipids (+Lac/Lip) were evaluated. Cho:NAA and variance in Cho:NAA values among different voxels within a tumor were each predictive of shorter survival. This prospective study shows that MRS can be used to identify high-risk patients and monitor changes in tumor metabolism, which may reflect changes in tumor behavior.

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