Planar spectroscopic imaging (EPSI) has recently been developed to map metabolite distribution throughout the brain with excellent spectral resolution and quality. The purpose of present study was thus to evaluate the potential of EPSI in assessing metabolic alterations in regions of brain potentially be used for other pathologies that diffusely affect the brain.

In conclusion, EPSI is an ideal spectroscopic sequence for studying metabolite alterations from different locations of a brain in ALS patients and can be recommended for use in ALS patients.

**Results:**

Representative summed voxels and corresponding spectra from the different locations of an ALS patient are shown in Fig 1. Significant reductions in NAA/Cr were observed from the preCG and IC from both the hemispheres. Significantly higher Cho/Cr ratios were also observed from these regions of ALS patients.

Discussion: These results demonstrate the ability of EPSI in assessing neuronal damage from ALS patients beyond the motor cortex and into the cortico-spinal tract, confirming the diffused nature of this disease. Reduction of NAA/Cr from the PreCG and IC reflects loss or dysfunction of neurons and axons. In fact, histologic studies from ALS patients and animal models have demonstrated loss of the giant pyramidal Betz cells along with vacuolation and astrogliosis in the cortical layers and the length of CST. Significantly higher Cho/Cr observed from these regions of ALS patients may be due to the combined effect of increased membrane turnover caused by degeneration of neurons and variable degree of gliosis.

In conclusion, EPSI is an ideal spectroscopic sequence for studying metabolite alterations from different locations of a brain in ALS patients and can potentially be used for other pathologies that diffusely affect the brain.

**Acknowledgements:** The work was supported by NIH grant 1R21NS063111 (JHW).

**References:**