5 YEAR LONGITUDINAL MRI FOLLOW-UP AND 1H SINGLE VOXEL MRS IN 13 PATIENTS WITH GLIOMATOSIS TREATED WITH TEMODAL, RADIOTHERAPY AND ANTIANGIOGENIC THERAPY.

J-M. Constans1,2, F. Kauffmann3, G. Hosu1, W. Dou1, J-M. Derlon2, E. Lechapt-Zalcmann3, S. Valable3, and J-S. Guillaum1,18
1MR Unit, CHU de CAEN, CAEN, Normandy, France, 2CERVOxy, CIC-ENP-CNRS, CAEN, Normandy, France, 3LMNO-UMR 6139, CNRS, CAEN, France, 4UMR 947, CIC-IT et INSERM, Nancy, France, 5Electronic, Tsinghua University, Beijing, China, People's Republic of, 6CHU de Caen, CAEN, France, 7CHU de Caen, Caen, France, 8CERVOxy, CIC-CNRS CI-NAPS, CAEN, France, 9CHU de Caen, France, 10CERVOxy, CICY-CERVA, Caen, France

Purpose: to better understand glial tumor metabolism and post chemotherapy, radiotherapy and antiangiogenic variations in a longitudinal study. To determine cerebral variation in MRS area, amplitude, and ratios of metabolites and spectral profiles during a 5 year longitudinal follow-up in 13 patients with gliomatosis without hyperperfusion initially and treated with Temodal and to detect changes in infiltration proliferation or lipids. Gliomatosis Cerebri (GC) is a challenging tumor, considered to have a poor prognosis and poor response to treatment.

Methods: MRI: Sagittal T1, axial proton density, T2, FLAIR, diffusion, 3D planes after gadolinium. MRS: 1H, voxel (6 to 12 cm3), PRESS with multiple TEs on a 1.5 T (GEMS) Over 13 patients, 9 underwent radiotherapy and 4 antiangiogenic therapy. Data processing: SA/GE software and home-written automatic processing (SCI-MRS-LAB in Scilab cINRIA-ENP C open source code) yielding amplitudes, areas, ratios, and relative concentrations.

Results: quantitative studies in MRI with multi-spectral segmentation and tissular classification are ongoing. Without chemotherapy spectroscopic profiles worsen with increases in Choline/N-Acetyl-Aspartate (Cho/NAA), Cho/Cr and Myoinositol/Creatine (mI/Cr) ratios, decreases in NAA/Cr and sometimes with increases in lactate. After chemotherapy treated tumoral volumes, in MRI, change little between two exams while spectroscopic profiles and ratios do change. MRS could, in fact, be more sensitive than MRI and could, in some cases, be predictive of worsening. The water and creatine are quite stable, which could justify using them for some other ratios to quickly detect spectroscopic variations. Cho concentration could be predictive in 5 out of 13 cases and more sensitive than ratios (3/13). Cho concentration increased in 2 patients with aggravation later. There is also decrease Cho concentration in 2 patients before clinical improvement.

Discussion and Conclusion: Temozolomide was well tolerated. MRI responses. MRS showed variable ratio of mI/Cr, Cho/Cr ratio and mI/Cr (at a lesser extent) condition improved and inverse results for These spectroscopic and metabolic changes improvement. MRS allows non-invasive variability, but repetition and modelisation up could allow us to diminish it and to under antiangiogenic therapy. Studying the relationship between MRS measures, methionine PET, segmentation and perfusion parameters could lead to better understanding of therapeutic response, especially with regard to chemotherapy and antiangiogenic molecules and in the future hypoxia modulators.

References: