

Seizure outcome and Brain Atrophy in Temporal Lobe Epilepsy Patients

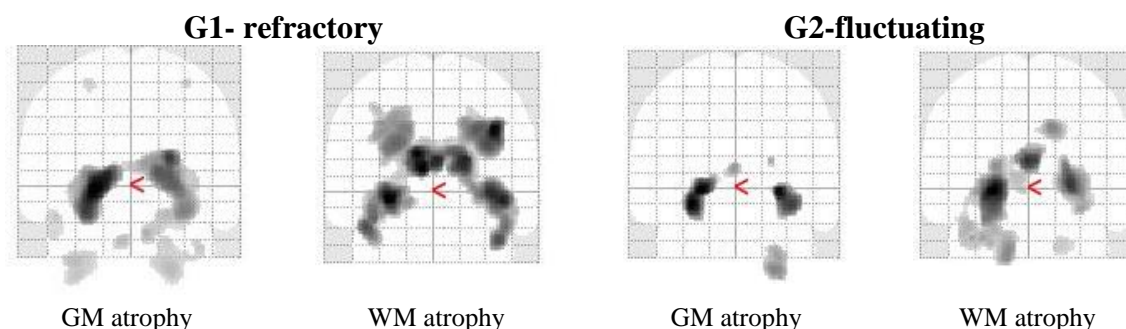
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Introduction: Although several studies have reported grey and white matter atrophy in patients with temporal lobe epilepsy[1], few have evaluated the impact of fluctuating seizure control on structural alterations. Therefore in this study we aimed to compare groups with refractory seizures and patients with alternating course of seizure control.

Materials and Methods: We included 178 TLE patients from Unicamp's Epilepsy Service and divided in 2 groups [G1- pharmacoresistant, 99 subjects; G2 – fluctuating, 79 subjects). For group comparisons, 192-paired healthy controls were selected from an MRI bank of healthy volunteers. Images were acquired at Hospital de Clínicas (Unicamp) using a 3 Tesla Philips MRI scanner including 3D-T1 weighted images (WI) (isotropic voxels of 1 mm³, acquired in the sagittal plane; 1 mm thick, flip angle=8°, TR= 7ms, TE 3.2ms, FOV= 240 x 240 x 180 mm³). All images were segmented according to standard SPM12/CAT 12 protocol (<http://www.neuro.uni-jena.de/cat/>) (www.fil.ion.ucl.ac.uk), which included: spatial normalization [MNI-152], tissue segmentation and smoothing. Quality control of image segmentation was performed. Statistical analyses of images were performed with SPM12 (T-tests between patients and controls).

Results: Group of patients and controls were balanced regarding gender ($p>0.05$) and age ($p>0.05$). The Figure below shows significant areas of GM and WM atrophy on both groups, more widespread on G1 group. ($p<0.05$, corrected with FWE).



Discussion: Comparison between groups of individuals with refractory and fluctuating TLE revealed significant areas of brain atrophy in relation to healthy individuals. In addition, the level of atrophy varies significantly from one group to another. Patients with refractory seizures (G1) have a more intense and broader atrophic effect when compared to those with fluctuating seizures (G2).

Conclusion: Pharmacoresistant group presented more widespread patterns of GM and WM atrophy. These results not only corroborate the hypothesis of the deleterious impact of epilepsy on brain's white and gray matter of the affected individuals, but also the different degrees of these effects in function of disease severity.

References: [1] Yasuda CL, Betting LE, Cendes F. Expert Rev Neurother, 2010. 10(6): p. 975-84.