**Cortical thickness changes and psychiatric symptoms in MTLE patients**

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**Introduction:** Mood and anxiety disorders are highly prevalent in patients with mesial temporal lobe epilepsy (MTLE) carrying significant morbidity and decreasing the quality of life of these patients. Its neural basis is poorly understood and deserves to be deeply investigated. The number of studies examining the correlations among MTLE, depression, and anxiety symptoms in relation to neuroanatomical basis is a small and insufficient1. The aim of this study was to investigate the cortical changes associated with depression and anxiety symptoms in MTLE patients.

**Materials and Methods:** We evaluated 145 patients with MTLE (with and without hippocampal atrophy, detected on high resolution MRI) and 74 healthy controls. MTLE patients were subdivided considering the presence or absence of hippocampal atrophy, yielding 4 groups: non-lesional (TLE-NEG,n=38), left (LTLE, n=48), right (RTLE, n=45) and bilateral (14). We excluded 14 patients with bilateral hippocampal atrophy given the small number of patients. Our final sample consisted of 131 MTLE patients (89 women) with a mean [± standard deviation] age of 44.37± 10.1 years and 74 controls (45 women) with a mean of age of 42.1±12.4 years. All participants underwent a high resolution MRI T1-weighted acquired in a 3T MRI scanner (Philips Medical Systems, Best, The Netherlands). We performed automated parcellation with FreeSurfer 5.3 (http://surfer.nmr.mgh.harvard.edu/) for volumetry and cortical thickness analyses. All participants completed both Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) to measure depression and anxiety symptoms respectively. IBM**®**SPSS20 software was used for statistical analysis. We performed correlations using the Spearman's correlation coefficient.

**Results:** In healthy controls we only observed a negative correlation between depression symptoms and thickness of right inferior parietal (r=-0.34, p<0.01). On TLE-NEG we detected a positive correlation between the BDI and cortical thickness of the left (r=0.32, p=0.04) and right (r=0.32, p=0.04) lateral occipital gyrus, and a negative correlation with the left pars triangularis (r=-0.4, p=0.01). BAI correlated negatively with the left caudal middle frontal (r=-0.35, p=0.03), left pars triangularis (r=-0.33, p=0.04), left superior frontal (r=-0.35, p=0.03), and right isthmus cingulate (r=-0.35, p=0.03). LTLE group presented negative correlation between BDI and right entorhinal cortex (r=-0.34, p=0.03). For RTLE group we observed positive correlations between BDI and cortical thickness of left caudal middle frontal (r=0.40, p<0.01), right frontal pole (r=0.37, p=0.01), right pars opercularis (r=0.41, p<0.01), right pars triangularis (r=0.33, p=0.04), right posterior cingulate (r=0.37, p=0.01), and right rostral anterior cingulate (r=0.34, p=0.02). In addition, there was a positive correlation between BAI and right isthmus cingulate (r=0.43, p<0.01), right posterior cingulate (r=0.6, p<0.01), and a negative correlation with right lateral occipital (r=-0.32, p=0.03).

**Discussion and Conclusion:** These findings show multiple areas of altered cortical thickness associated with worsening depression and anxiety symptoms in patients with MTLE, indicating a large network of brain areas related to the co-occurrence of psychiatric symptoms and epilepsy, especially when compared with the healthy controls. Understanding these correlations in the future may help to develop a more specific treatment for MTLE patients with psychiatric disorders.

**References:** [1] Butler T, Blackmon K, McDonald CR et al., Cortical thickness abnormalities associated with depressive symptoms in temporal lobe epilepsy. Epilepsy & Behavior 23 (2012) 64–67.