Cortical thickness correlates with symptoms in adolescents newly diagnosed with Obsessive-Compulsive Disorder

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Target audience: Neuroscientists

Purpose/Introduction: Obsessive compulsive disorder (OCD) is a disabling anxiety disorder, commonly with an onset during late childhood or early adulthood. The purpose of the study was to explore morphometric manifestations and correlates of newly diagnosed OCD patients before start of treatment. Specifically, the aims of the study were (1) to compare morphometric results between patients with OCD and healthy controls and (2) to evaluate the relationship between morphometric results and the symptom severity in the patient group as quantified with the Children’s Yale-Brown Obsessive Compulsive Scale (CYBOCS).

Subjects and Methods: T1-weighted 3D MR brain images of 22 adolescents newly diagnosed with OCD (treatment naive) and 22 age and gender matched controls were acquired using a TFE sequence on a 1.5 T Philips Achieva MR scanner and a 1.5 T Philips Intera MR scanner (Best, the Netherlands) with voxel size 1.25 mm (isotropic). The 3D images were processed with the image analysis software FreeSurfer2 (version 5.1). The morphometric results which were further processed were the cortical thickness maps, smoothed with Gaussian kernel (FWHM = 10 mm), and the volume measurements of the subcortical structures. The data was analyzed using principal component analysis scaled subprofile modeling3 (PCA/SSM), as outlined in figure 1, to produce patterns of areas with significant difference between groups or correlation to CYBOCS. The method utilized nonparametric permutation tests3 to correct for multiple testing as well as bootstrapping4 to assess the robustness of the resulting pattern.

Results: A significant correlation between cortical thickness and CYBOCS, p = 0.035, was found. Areas of large effect in the corresponding pattern included the fusiform gyrus as well as medial areas in the parietal lobe (fig. 2). No other significant results were found, neither group differences nor correlation to CYBOCS.

Discussion/Conclusion: Cortical thickness in various medial areas of the brain of treatment naïve OCD patients was found to correlate with symptom severity, indicating increased/decreased function of these areas.

References:
1. http://surfer.nmr.mgh.harvard.edu/