What does the last decade of neuroimaging research tell us about the ADHD brain?

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Abstract.

Over the last decade, the number of neuroimaging studies in ADHD has increased dramatically. In terms of brain structure, MRI and DTI studies have evidenced differences in volume, surface-based measures (cortical thickness, surface area, and gyrification) and white matter integrity in different cerebral regions in children and adults with ADHD, as compared to typically developing individuals. Abnormalities in the basal ganglia, prefrontal structures and the corpus callosum have been the most consistently reported findings across studies. Hemodynamic (fMRI, fNIRS, PET, SPECT) and electro-magnetic neuroimaging techniques (EEG, MEG) have also evidenced differences in neural activity during the execution of neuropsychological tasks and during rest, in widespread regions. Importantly, multimodal studies combining structural and functional methods have shown an intercorrelation between structural and functional abnormalities in ADHD. Finally, further longitudinal studies are needed to clarify the effects of age and medication on brain structure and function in individuals with ADHD.