Cortical thinning of temporal pole and orbitofrontal cortex in medication-naïve children and adolescents with ADHD

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Psychiatry Research: Neuroimaging
DOI: http://dx.doi.org/10.1016/j.pscychresns.2014.07.004

Abstract
Structural and functional brain studies on attention deficit/hyperactivity disorder (ADHD) have primarily examined anatomical abnormalities in the prefronto-striatal circuitry (especially, dorsal and lateral areas of the prefrontal cortex and dorsal striatum). There is, however, increased evidence that several temporal lobe regions could play an important role in ADHD. The present study used MRI-based measurements of cortical thickness to examine possible differences in both prefrontal and temporal lobe regions between medication-naïve patients with ADHD (N=50) and age- and sex-matched typically developing controls (N=50). Subjects with ADHD exhibited significantly decreased cortical thickness in the right temporal pole and orbitofrontal cortex (OFC) relative to healthy comparison subjects. These differences remained significant after controlling for confounding effects of age, overall mean cortical thickness and comorbid externalizing conditions, such as oppositional defiant and conduct disorders. These results point to the involvement of the temporal pole and OFC in the neuropathology of ADHD. Moreover, present findings add evidence to the assumption that multiple brain regions and psychological processes are associated with ADHD.