

## The Effect of an Abnormal Prefrontal Cortex on the Symptoms of Attention Deficit/Hyperactivity Disorder

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**Abstract :** Hypothesis: Attention Deficit Hyperactivity Disorder is the result of an underdeveloped prefrontal cortex which is the primary cause for the signs and symptoms seen as defining features of ADHD. Methods: Through 'PubMed', 'Wiley' and 'Google Scholar' studies published between 2011-2018 were evaluated, determining if a dysfunctional prefrontal cortex caused the characteristic symptoms associated with ADHD. The search terms "prefrontal cortex", "Attention-Deficit/Hyperactivity Disorder", "cognitive control", "frontostriatal tract" among others, were used to maximize the assortment of relevant studies. Excluded papers were systematic reviews, meta-analyses and publications published before 2010 to ensure clinical relevance. Results: Nine publications were analyzed in this review, all of which were non-randomized matched control studies. Three studies found a decrease in the functional integrity of the frontostriatal tract fibers in conjunction with four studies finding impaired frontal cortex stimulation. Prefrontal dysfunction, specifically medial and orbitofrontal areas, displayed abnormal functionality of reward processing in ADHD patients when compared to their normal counterparts. A total of 807 subjects were studied in this review, yielding that a little over half (54%) presented with remission of symptoms in adulthood. Conclusion: While the prefrontal cortex shows the highest consistency of impaired activity and thinner volumes in patients with ADHD, this is a heterogenous disorder implicating its pathophysiology to the dysfunction of other neural structures as well. However, remission of ADHD symptomatology in adulthood was found to be attributable to increased prefrontal functional connectivity and integration, suggesting a key role for the prefrontal cortex in the development of ADHD.

**Keywords :** prefrontal cortex, ADHD, inattentive, impulsivity, reward processing

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