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ABNORMALITIES IN COOL (INHIBITION RESPONSE) AND HOT (REWARD ANTICIPATION) EXECUTIVE FUNCTIONS IN MEDICATION NAÏVE ADHD ADULTS

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Introduction: Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disease characterized by symptoms of inattention, hyperactivity, and impulsivity.

Current accounts of ADHD postulate the existence of at least two different but not mutually exclusive ADHD endophenotypes: those characterized by cognitive executive function (“cool EF”) abnormalities, presumably produced by dysfunctions in dopaminergic mesocortical branches; and those characterized by abnormalities in reward management processes (also known as “hot EF”), which are thought to result from alterations in dopaminergic mesolimbic circuits.

The aim of the present study is to assess brain activity during “cool EF” and “hot EF” in adults with ADHD and to identify the neurobiological and behavioral interrelation between the each of the processes.

Methods: Sample: 19 control subjects and 19 ADHD adults, naïve.

In order to assess “cool EF”, we employed a paradigm assessing inhibition response, the Go-noGo task. A reward paradigm was used to assess hot EF functions.

Results: Preliminary results are in line with previous functional magnetic resonance imaging showing reduced ventro-striatal activation during reward anticipation in ADHD. In addition, results derived from the inhibition response paradigm are also in agreement with neuroimaging and lesion studies, appointing the right inferior frontal cortex as a key region for inhibition processing.

Conclusions: Our results indicate the existence of alterations in cool EF and hot EF as reflected by abnormal activity in dopaminergic mesocortical and dopaminergic mesolimbic circuits. These findings underline the importance of taking into account both “cool EF” and “hot EF” in order to understand the neurobiology of ADHD.