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FRONTO-STRIATAL BRAIN DYSFUNCTION IN ADULTS WITH HYPERACTIVE/INATTENTIVE BEHAVIOURS FOLLOWED UP FROM CHILDHOOD DURING INTERFERENCE INHIBITION AND ATTENTION ALLOCATION

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Functional magnetic resonance imaging studies (fMRI) in children with Attention Deficit Hyperactivity Disorder (ADHD) have observed functional abnormalities in fronto-striatal and temporo-parietal brain regions during tasks of inhibitory and attention control. However, hardly any modern functional imaging studies have investigated functions of interference inhibition or attention control in adult ADHD.

We used fMRI combined with a variant of the Simon task that measures interference inhibition as well as attention allocation to compare 11 medication-naïve adults (26-30 yrs) with inattentive/hyperactive behaviours and 15 age-matched healthy controls. Patients were followed up from childhood ADHD, recruited from a 20-year prospective longitudinal epidemiological study. All met criteria for inattentive/hyperactive behaviours on an Adult Hyperactive Interview, but only 8 met clinical diagnostic criteria for ADHD. Correlation analyses were furthermore conducted within patients to correlate symptoms with brain activation. Functional connectivity analyses for group differences in fronto-striatal connectivity will be presented at the conference.

No differences were observed in task performance. During interference inhibition, adults with persistent inattentive/hyperactive compared to controls showed reduced activation in predominantly left orbitofrontal and medial cortex, caudate and putamen. During attention allocation adults with hyperactive behaviours showed dysfunction in left inferior/dorsolateral prefrontal cortex and in right inferior and superior parietal areas. Correlation analysis showed a significant negative correlation between inattentive/hyperactive behaviours and the parietal activation cluster during interference inhibition. The study demonstrates the continuity of the pattern of fronto-striatal and parietal neurofunctional abnormalities during tasks of interference inhibition and attention allocation from childhood to adult ADHD even with symptomatic improvement.

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