

P01-04

DISORDER-SPECIFIC RIGHT INFERIOR PREFRONTAL DYSFUNCTION DURING TWO TASKS OF INHIBITORY CONTROL IN PEDIATRIC ATTENTION-DEFICIT/HYPERACTIVITY DISORDER COMPARED TO PEDIATRIC OBSESSIVE-COMPULSIVE DISORDER

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Inhibitory dysfunction is the key behavioural and cognitive phenotype of Attention Deficit Hyperactivity Disorder (ADHD) and of obsessive-compulsive-disorder (OCD). Both disorders show deficits in tasks of response inhibition and cognitive flexibility as well as fronto-striatal brain dysfunctions during task performance. The goal of this research was to investigate differences and commonalities in functional neural networks mediating inhibitory control between adolescents with ADHD and those with OCD to identify disorder-specific neurofunctional biomarkers.

Event-related functional magnetic resonance imaging (fMRI) was used to compare brain activation of 18/12 boys (Stop/Switch task) with clinical ADHD, 10 boys with clinical OCD and 20 healthy comparison boys during a tracking Stop task measuring motor response inhibition and its failure and a switching task measuring cognitive flexibility. Non-parametric permutation analyses were used for fMRI analysis (XBAM). Functional connectivity analyses investigating group differences in fronto-striatal connections will be presented at the conference.

Both patient groups shared brain dysfunction compared to controls in right orbitofrontal, left dorsolateral (Stop task) and left inferior prefrontal cortices (Switch task). Right inferior prefrontal under-activation, however, was specific to ADHD during both tasks. Under-activation in left caudate and anterior cingulate was also specific to ADHD during the Switch task.

Patients with ADHD appear to have both common and distinct dysfunctions during inhibitory control compared to OCD patients. The most consistent fMRI finding in ADHD of a dysfunction in right inferior prefrontal cortex during inhibitory control appears to be disorder-specific when compared to OCD, and may be a specific neurofunctional biomarker of ADHD.