

P02-150 - **BEHAVIORAL CONTROL PROCESSES IN ADULT ADHD: EVIDENCE FROM A SIMULTANEOUS EEG/FMRI-STUDY**

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Executive functions comprise various cognitive abilities including the inhibition of prepotent responses and voluntary decisions. Several studies showed medial-frontal activations in tasks with the free selection of responses. The inhibition of prepotent response tendencies seems to be associated with medial frontal as well as lateral frontal BOLD responses. The aim of this simultaneous EEG and fMRI study was to discriminate the neural correlates of behavioural control processes in ADHD.

8 adults with ADHD and 8 matched healthy subjects performed a go/nogo task comprising three different conditions: during the go condition, subjects were instructed to press a response button as fast as possible; during the nogo condition, this response was to be inhibited. In the voluntary selection task participants were allowed to freely decide, whether to press the response button or not.

The fMRI protocol used a gradient-echo EPI pulse sequence. Further analyses were done with using the BrainVoyager software package (Goebel, Maastricht). EEG signals were simultaneously recorded (Brain Products, Munich).

Electrophysiologically, the nogo task and voluntary decision task led to a negative decline especially in fronto-central brain regions (N2) in both groups. Regarding the functional MRI data we found inhibition-associated BOLD responses especially medial-frontal in the pre-SMA and activations in the medial part of BA 8 for the voluntary selection. ADHD patients showed a reduced contribution of frontal brain regions during free responses compared to controls.

The results may indicate that selection processes are related with dysfunctions predominantly in frontal brain regions in ADHD patients.