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RESPONSE INHIBITION IN ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD): THE INFLUENCE OF EMOTIONAL-VALENCE ON THE P300 BRAIN POTENTIAL.

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Introduction: Emerging evidence suggests that disturbances in emotional processing in ADHD may interfere with executive functioning, and account for impairments in life functioning.

Objective: To investigate whether patients with ADHD evidence deficits in processing emotionally-valenced inputs, and to delineate the neurobiological correlates of these deficits.

Methods: Using event-related potentials from 128-channels, we tested 33 adult ADHD subjects and 29 individually-matched healthy controls (HC) in a cognitive control task of response inhibition. The task was performed by presenting valenced pictures (positive/negative/neutral) of the International Affective Picture System. The pictures were shown in random sequence, and repeated occasionally. Participants were asked to respond to each stimulus, and to withhold response for the repetition.

Results: With regard to behavioral measures, ADHD subjects showed more commission and omission errors. In terms of ERPs, both groups displayed a pronounced P300 component for all emotional valences in the frontal regions in the NoGo vs. the Go condition ('NoGo P300'). However, compared to HC's, ADHD subjects showed a significant P300 reduction for negative, but no reduction for positive, or neutral stimuli.

Conclusions: Regarding the frontal NoGo P300, HC's were able to overcome the intrusion of negative emotion, and showed the same waveform when presented with negative as they showed with positive or neutral stimuli. By contrast, while ADHD subjects did not differ from HC's regarding positive and neutral inputs, they exhibited a pronounced P300 reduction for negative pictures, which may constitute a neurobiological correlate of emotional dysregulation.

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