The relationship between early and late event-related potentials and temperament in adolescents with and without ADHD.

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Abstract

Differences in emotional processing are prevalent in adolescents with attention deficit/hyperactivity disorder (ADHD) and are related to clinical impairment, but substantial heterogeneity exists. Within ADHD, some individuals experience difficulty with positive/approach emotions, negative/withdrawal emotions, or both. These problems may reflect differences in emotional reactivity, emotion regulation, or a combination, and the neurophysiological correlates remain unclear. Event-related potentials were collected from 109 adolescents (49 with ADHD) while they completed an emotional go/no-go task with three conditions: happy (positive/approach), fear (negative/withdrawal), and neutral. The P1 and N170 were used as a marker of early emotional processing and the P3b and late positive potential (LPP) were used as markers of later elaborative emotional processing. Emotional response style was assessed with parent and adolescent report on the Early Adolescent Temperament Questionnaire. There were no effects of emotion or group for the P1. Typically-developing adolescents exhibited a larger N170 to emotional vs. neutral faces while adolescents with ADHD showed the opposite pattern. All adolescents exhibited a larger P3b to fearful versus other faces and a larger LPP to emotional vs. non-emotional faces. Within the ADHD group, N170 responses to happy faces predicted parent ratings of positive/approach emotions. Findings highlight the importance of considering within-group heterogeneity when studying clinical populations and help clarify the time-locked neurophysiological correlates of emotion dysregulation.