Event-Related Potentials Correlate with the Severity of Child and Adolescent Patients with Attention Deficit/Hyperactivity Disorder.


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Abstract

BACKGROUND:
Attention deficit/hyperactivity disorder (ADHD) symptoms can continue through adolescence and adulthood, including difficulty in staying focused, paying attention, and controlling behavior, as well as hyperactivity. While children and adolescents with ADHD have functional impairments at multiple dimensions, there are no objective biological indicators to assess the severity of ADHD. Event-related potentials (ERPs) are widely used as a noninvasive method for evaluating sensory and cognitive processes involved in attention tasks. Previous studies have shown that P300 amplitude or latency, a main component in ERPs, is altered in patients with ADHD. However, little is known about the relationship between P300 and the severity of ADHD symptoms.

METHOD:
We sought to measure both P300 amplitude and latency in ERPs during auditory oddball tasks in 44 patients with ADHD (mean age ± SD 10.28 ± 3.43 years) and 15 age- and gender-matched normally developing children (11.40 ± 3.02 years). In ADHD patients, we also assessed symptom severity using the ADHD rating scale-IV-Japanese version.

RESULT:
In ADHD groups, P300 amplitude and latency were attenuated and prolonged compared to controls at the frontocentral, centroparietal, and parietal positions. Furthermore, levels of P300 latency at these positions are positively correlated with the inattention subscale scores measured by the ADHD rating scale-IV-Japanese version.

CONCLUSIONS:
The present study revealed that the degree of P300 latency might reflect the severity of ADHD symptoms with children and adolescents, suggesting that ERPs are a useful technique to evaluate the severity of ADHD symptoms.