# An event-related potential study of P300 in preschool children with ADHD

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## Background & Objective

Current studies generally support that the cognitive function deficit is an essential contributor to the symptoms with attention deficit hyperactivity disorder (ADHD), and this association is well-documented not only in school-age children but also in preschoolers. ERP, as a non-invasive measurement of brain state and neural activation, has been widely used in the studies to explore the cognitive functions due to their high temporal resolution and functional relevance.

The present study was conducted to investigate whether there are differences in cognitive function between preschool children with ADHD and normal preschoolers aged 3-5 years, by analyzing and comparing the characteristics of their P300 waves, with the aim of exploring new approaches for the study of cognitive function in preschool children with ADHD.

## Methods

A total of 58 preschool children aged 3-5 years were selected from the outpatient clinic of Neurology and Health Care Department of the Children's Hospital Affiliated to the Capital Institute of Pediatrics from March 2021 to March 2023. They were divided into the ADHD group (33 cases) and healthy children group (25 cases). Event related potential P300 was measured in all children and the amplitude and latency of the wave were compared between the two groups separately.

## Results

The amplitude of P300 at C4 point in ADHD group [(0.16±5.47) μV] was significantly lower than it in the healthy children group [(3.21±5.34) μV] ($P < 0.05$). The latency of P300 at Pz point in ADHD group [328.13(299.31, 356.94) ms] was significantly longer than it in the healthy children group [302.73(264.16, 341.31) ms] ($P < 0.05$).

## Conclusion

The differences between two groups in P300 test show that preschool children with ADHD present lower amplitude at right central zone and longer latency at parietal lobe compared with healthy children. It may suggest that attention cognition is already impaired in preschool children with ADHD.

## Keywords

attention deficit hyperactivity disorder; cognition function; event related potential; children

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