The relationship between physical fitness and inhibitory ability in children with attention deficit hyperactivity disorder: An event-related potential study

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Abstract

Objectives
The purpose of the current study was to examine the relationship between physical fitness and interference control by comparing higher and lower fitness children with attention deficit hyperactivity disorder (ADHD) using event-related potentials (ERPs) and behavioral indices.

Design
Cross-sectional design was employed.

Method
Eighty children, previously diagnosed with ADHD, were evaluated on their inhibitory ability as measured during their participation in the flanker task, and this ability was examined in relationship to measures of their physical fitness. Only children in the top 40% or in the bottom 40% of the distribution for each fitness components were included in the statistical analysis.

Results
The results showed that children with higher levels of muscular endurance, muscular power, and aerobic capacity had shorter reaction times (RT) and larger P3 amplitudes compared to less fit children. In addition, children with lower body composition had shorter reaction times and shorter P3 latencies compared to those with higher body composition.

Conclusions
Better physical fitness, especially muscular endurance, muscular power, aerobic capacity, and body composition, were associated with enhanced interference control in children with ADHD. Our findings suggest the need for a closer examination of the possible impact of different aspects of fitness on the general relationship between physical fitness and cognition.