Deficits in auditory sensory discrimination among children with attention-deficit/hyperactivity disorder

Yi-Min Tien/ Vincent Chin-Hung Chen; Tun-Shin Lo; Chia-Fen Hsu; Michael Gossop; Kuo-You Huang

European Child & Adolescent Psychiatry
DOI: https://doi.org/10.1007/s00787-018-1228-7

Abstract

Research into children with attention-deficit/hyperactivity disorder (ADHD) has focused on complex cognitive dysfunction, but less attention has been paid to sensory perception processes underlying the symptoms of ADHD. Based on signal detection theory, the present study compared the sensory discrimination ability and decision bias of children with and without ADHD. It also investigated the differences between ADHD with predominantly inattentive (ADHDi) and combined presentations (ADHDc). The sample of 75 children and adolescents with ADHD (24 ADHDi, 51 ADHDc) (16 females and 59 males) and 22 typical developing controls (TD) (8 females and 14 males) completed an auditory signal detection task. Participants were asked to detect signals against levels of transient background noise (35, 45, 55, and 65 dB). The results showed that with the increase of noise levels, both the ADHD and TD groups demonstrated decreased sensory discrimination. Although both groups successfully detected signal against noise levels from 35 to 55 dB, the ADHD group showed lower discrimination ability than that of the TD group. For decision bias, no group difference was found. Further comparisons regarding the predominant symptom presentation of ADHD sub-groups showed no differences. Current research has suggested that the deficit in ADHD people’s signal detection performance can be attributed to sensory discrimination rather than decision bias. We suggest that background noise should be taken into account when using auditory stimuli to investigate cognitive functions in people with ADHD.