Executive function predicts the visuospatial working memory in autism spectrum disorder and attention-deficit/hyperactivity disorder


Abstract

Children with autism spectrum disorder (ASD) and those with attention deficit/hyperactivity disorder (ADHD) always show working memory deficits. However, research findings on the factors that affected the working memory in ASD and ADHD were inconsistent. Thus, we developed the present study to investigate the association of executive function (EF) with the visuospatial working memory (VSWM) in ASD and ADHD. Three groups of participants were examined: 21 children with ASD, 28 children with ADHD and 28 typically developing (TD) children as the controls. All participants completed two tests: the Wisconsin Card Sorting Test (WCST) and the Corsi Block Tapping Test for measuring EF and VSWM, respectively. The WCST included four domains: categories achieved (CA), perseverative errors (PE), failures to maintain set (FMS), and total errors (TE). The findings indicated that (1) the ASD group showed poorer performance in VSWM than the ADHD and TD groups; (2) for the ASD group, VSWM was positively correlated with CA, and was negatively correlated with PE and TE; (3) for the ADHD group, FMS showed a negative relationship with VSWM; and (4) TE predicted the performance of VSWM in ASD group, while FMS predicted VSWM in ADHD group. The study results suggested that VSWM was impaired in ASD but not in ADHD. Also, the EF domains were differently correlated with the VSWM performance in ASD and ADHD. Our study suggests that we should consider different intervention targets of working memory and EF contributions in improving the cognitive capacity of ASD and ADHD.