Neural processing of working memory in adults with ADHD in a visuospatial change detection task with distractors

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Abstract

Individuals with Attention-Deficit Hyperactivity Disorder (ADHD) are often characterized by deficits in working memory (WM), which manifest in academic, professional, and mental health difficulties. To better understand the underlying mechanisms of these presumed WM deficits, we compared adults with ADHD to their peers on behavioral and neural indices of WM. We used a visuospatial change detection task with distractors which was designed to assess the brain's ability to effectively filter out distractors from WM, in addition to testing for effects of WM load. Twenty-seven unmedicated adults with ADHD were compared to 27 matched peers on event-related potential (ERP) measures of WM, i.e., the contralateral delay activity (CDA). Despite severe impairments in everyday life functioning, findings showed no difference in deficits in behavioral tests of working memory for adults with ADHD compared to their peers. Interestingly, there were differences in neural activity between individuals with ADHD and their peers showing that the CDA of individuals with ADHD did not distinguish between high, distractor, and low memory load conditions. These data suggest, in the face of comparable behavioral performance, a difference in neural processing efficiency, wherein the brains of individuals with ADHD may not be as selective in the allocation of neural resources to perform a WM task.